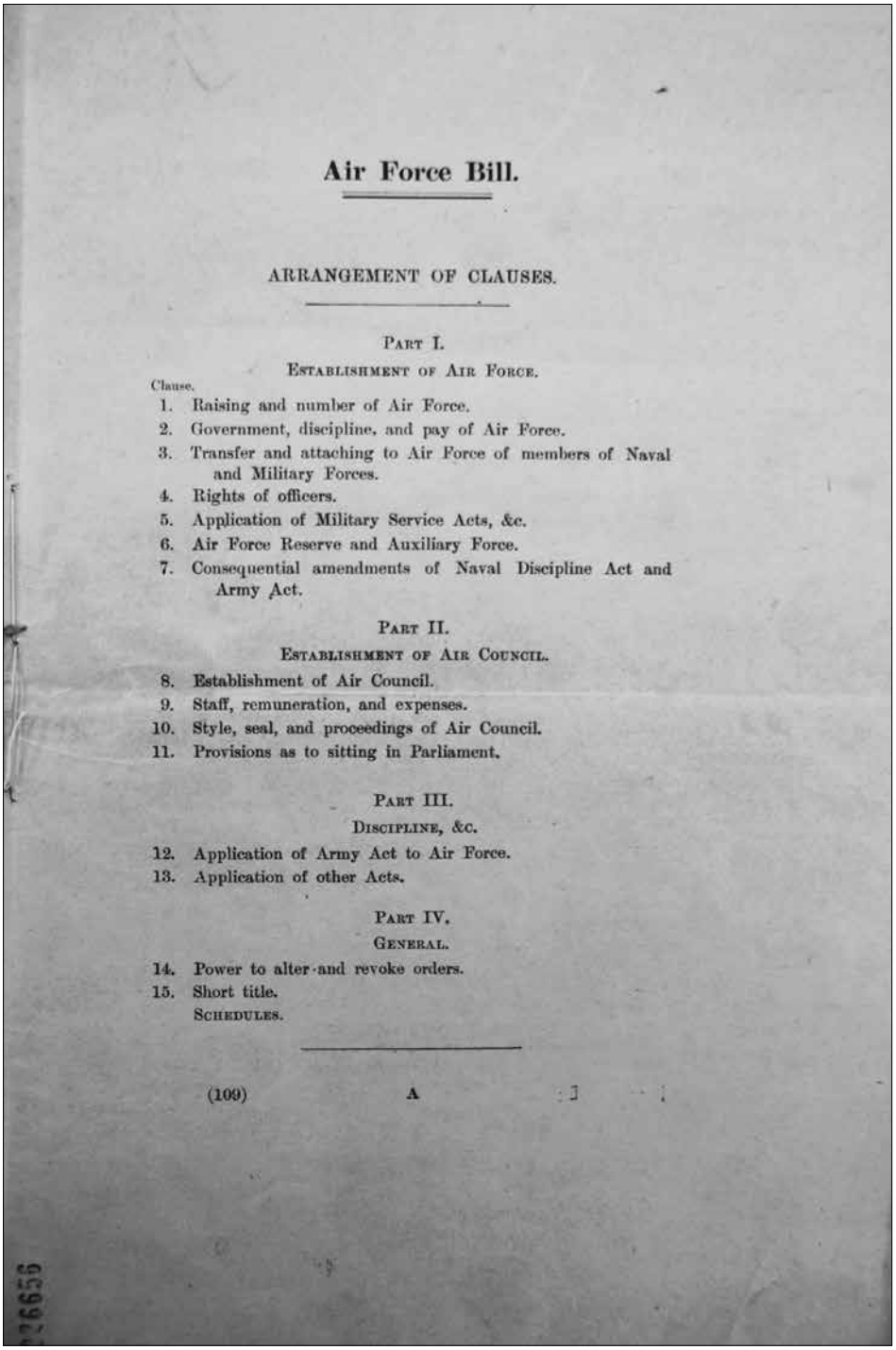
# Formation of The Royal Air Force



# Air Force Bill.

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Front Cover of the Air Force Bill, courtesy of the Royal Air Force Museum Archive, Hendon

## AIR FORCE BILL.

*HC Deb 16 November 1917 vol 99 cc739-8260*

As amended, considered.

*Mr. SPEAKER*

I have some doubt as to the first New Clause, standing in the name of the hon. and gallant Member for Rutland (Colonel Gretton)—(Air Council not to Order or Conduct Warlike Operations). That is the very object of the Bill I should think, and this seems to be a negative of the whole Bill.

*Colonel GRETTON*

On a point of Order. The matter has been raised and .discussed on previous occasions. As no doubt you are aware, the Air Council has many functions, and it may be—and, as I understand, probably is—intended that, under certain circumstances, it will undertake warlike operations. I therefore submit it is in order. It is to transfer what the Air Board is doing to the Air Council, with increased powers, and the question is in what direction those powers are to be increased.

*Mr. SPEAKER*

I should like to hear what the hon. and gallant Member says, but it is very doubtful.

## NEW CLAUSE.—(Air Council not to Order or Conduct Warlike Operations.)

*HC Deb 16 November 1917 vol 99 cc739-41*

The Air Council shall not order warlike operations or make war by itself, but the Air Council shall transfer and attach to the naval and military forces of the Crown such Corps, Units, Officers, and men of the Air Force as may be determined in consultation and agreement with the Board of Admiralty or the Army Council, or both of them, and the Board of Admiralty and the Army Council may attach and transfer such Corps, Units, Officers, and men to any part of the Force subject to their orders, respectively.—[Colonel Gretton.]

*Colonel GRETTON*

I beg to move the Clause. I wish to explain to the Committee that the two Clauses standing in my name are part of the same subject. Very late on the Committee stage it was explained to the Committee that the duty of the Air Council will be to supply and hand over to the command of the Army and Navy, as the case may be, all the aircraft which is required for the conduct of naval and military operations, but there is a third question still remains which has not been definitely explained to the House. The Air Board has hitherto been a Board of Supply only, but the Army Council is to provide machinery and undertake the training of personnel as well as the supply of apparatus. So far there has been no criticism offered on

that principle. The Air Council under this Bill, as it now stands, will have power to order warlike operations and undertake them independently either of the Army or the Navy, and it is a matter upon which I desire, if possible, to obtain some information from the Government. I put before the Committee arguments which I think will not be refuted and cannot be, that one of the main principles which leads to success in war is unity of command, and that violation of that principle always leads to weakness in the conduct of war, if not to disaster.

I am not going to discuss strategy or tactics, but so far as the principle of command is involved in naval and military operations, that is provided for by the explanation given by the Government. It will be the duty of the Army Council to provide all that the Army and Navy require. The Government have not yet explained whether the whole of the Air Service in every part, including the Antiaircraft Service is to be handed over to the Air Council. No doubt some explanation will be given on that point before we part with the Bill in this House. The point which arouses apprehension is that a third command is intended to be established by this Bill. We already have the Army Council, and we have a separate command in the Navy acting under the Lords of the Admiralty and the officers appointed by that Board. Even this division of command has great difficulties, and may lead to still further difficulties in the future, but this Bill proposes to set up a third War Council, and it opens up new problems and difficulties which will cause considerable apprehension. It would appear that the naval force, when acting in conjunction with land operations, should be in command of the military officer, and the same would appear to apply to the officer, commanding the naval forces dealing with a large area of the sea. The problems involved in the unity of command are very great. We suffer in this country from the fact that we have no supreme War Staff manned by men whose whole training and career have been spent in the study of problems of war and how to conduct war successfully. In this country the War Cabinet is a civilian body.

*Mr. SPEAKER*

The hon. and gallant Gentleman is now wandering all over the place, and he is not confining himself to the subject-matter of this Clause at all.

*Colonel GRETTON*

Then I will bring any remarks directly back to the point. It will be difficult to combine the warlike operations of the Air Council with the warlike operations ordered by the Army Council and the Board of Admiralty. That is the difficulty I am anxious should be avoided. The difficulty of a third command which this Bill apparently proposes to set up is bound to create this difficulty, and there is no machinery to overcome it. Unless a strong reason is given to the contrary, it would appear that the Air Forces should be at the disposal of the Army Council or the Board of Admiralty, and that this new Air Council should be a board of training and supply, and the actual operations of war should be entrusted to either the military or naval authorities. Those are the considerations I wish to place before the attention of the House.

*Mr. BILLING*

I beg to second the Amendment. If this proposal were carried out it would defeat those purposes of the Bill which are beneficial to the Service.

*Mr. SPEAKER*

The hon. Member has just given a very good reason why this Amendment is out of order, and I must decline to put it. The other new Clauses, standing in the name of the hon. Member for East Herts (Mr. Billing), should come as Amendments, but not as new Clauses.

## CLAUSE 1.—(Raising and Number of Air Force.)

*HC Deb 16 November 1917 vol 99 cc741-7*

It shall be lawful for His Majesty to raise and maintain a force, to be called the Air Force, consisting of such number of Officers, Warrant Officers, non-commissioned Officers, and men as may from time to time be provided by Parliament.

*Mr. BILLING*

I beg to move, after the word "the," to insert the word "Imperial."

I am encouraged to move this Amendment by the remarks of an hon. Member which indicated that there is an idea in the mind of the Government to eventually include on the Council of the Air Service representatives from overseas. There are people in this country who resent the word "Imperial," but I am suggesting it in connection with this Bill in the sense of the unity of the Empire and quite distinct from any other meaning which may have been attached to it. I consider that if the Air Service is to develop on such lines as will render it of value to the Empire it is essential that they should have co-operation, assistance, and guidance of those men who are guiding the forces and destinies of the Dominions generally. If that is the case it is quite possible and reasonable that this word should be embodied in the very title of the Bill itself. It would be a graceful compliment to our men from overseas, because, whatever critics may say, they have certainly not failed us in this War. They have come forward not only in the trenches and on the seas, but more particularly in our Air Services. I am sure that the hon. and gallant Member (Major Baird) on the Front Bench will echo what I say when I tell the House that a very considerable number of our pilots, numbering some of the most gallant among them, men who have attained great prominence as expert pilots and fighting airmen, have been drawn from the Colonies themselves.

When this Air Service develops as it must, it will be absolutely essential that we should have bases throughout the Empire. It may be suggested that these bases should be organised by the Dominions themselves, but we shall have to use them not only for our fighting forces but also in peace time, because it will be impossible to keep up the establishment of a vast number of airmen in peace time unless they are given something to do. There are no facilities in the Air

Service like there are in the Army and the Navy for keeping the men in training. The question of materiel is even more important. The life of an aeroplane is so short that it is quite feasible, unless the machines are employed for something more than mere flying from aerodrome to aerodrome, that it will be impossible to keep them up to date. That is why I think it would be an excellent thing if this name were embodied in the Bill so as to throw out the suggestion to the Dominions that it is the wish of the Government eventually, if not at the present time, to make this Air Service a comprehensive unit for the whole Empire, and by so doing to encourage the formation of bases throughout the Empire to be used in times of peace for mail carrying and various other Imperial duties of an Imperial Government. I strongly recommend this Amendment, not in any sense of Jingoism, but purely as a means, and a very simple means, of paying a graceful compliment to the Colonies, which I am sure they will appreciate, and of putting the hall-mark on the statement of the hon. and gallant Member in Committee, that the only reason they did not wish to limit the numbers on the Council was that they might have the opportunity of having representatives from the Colonies and the Dominions upon it. Surely there can be no reasonable excuse or justification for refusing to accept this Amendment, and I hope there will be Members who are sufficiently interested in our Imperial destiny to second the Motion.

*Colonel Sir HAMAR GREENWOOD*

I beg to second the Amendment, and it is so seldom that I find myself in accord with the hon. Member that I do with special pleasure. I second it primarily because the Air Service is, in fact, an Imperial Air Service. Australia has its own Air Service, but Canada has not. The British Government have already circularised the Canadian Forces to supply airmen and officers for the Air Service. That at once makes it, as a matter of fact, the Imperial Air Force, and it is a misnomer to describe it as an Air Force. I think the word "Imperial" is more akin in this connection than the word "Royal," used in connection with the Navy, and I hope that the Government will adopt the term, which has a significance, outside this country, of a great national import.

*The PARLIAMENTARY SECRETARY to the AIR BOARD (Major Baird)*

This Amendment obviously commands the greatest possible sympathy; but there is this difficulty, that, in order to accept it, it will be necessary to consult the Dominion authorities, and we have not been able to do so.

*Sir H. GREENWOOD*

What! In order to use the word "Imperial"?

*Major BAIRD*

Yes, the military forces of Canada and Australia are practically autonomous. Australia has got its own pilots. Canada, it is true, has not; but I know, from personal experience, that there is a great desire for a Canadian squadron. It is quite easy to understand that the men of those great Dominions would like the deeds of their fellow citizens to be identified with the Dominion from which they come. That does not in the least dispose of the very desirable view put forward

by the hon. Member who moved this Amendment, that we should unify the whole of that Service just as we desire to unify the Service as it applies to Great Britain, by abolishing the imaginary high-water mark which at present unnecessarily divides the airmen operating with the naval and military forces. It is impossible to controvert the desirability of including the Dominions, but I hope the Amendment will not be carried, because, although we are entirely sympathetic, we are really not in a position to take them over, and if it were pressed it might lead to misunderstanding.

*Mr. LYNCH*

I can hardly support the elaborations of my hon. Friend (Mr. Billing), in moving to insert in this Bill the word "Imperial." I am surprised to find that a man so up to date should by some mental hiatus seem to be about ten years behind hand in this regard. In the course of his excellent speech he kept referring to these Dominions as "colonies." Nothing could be more behind-hand than to dub them as "colonists." They are not colonists; they are self-substantial men, who, I hope, have a great future before them, and my hon. Friend seems to miss the very A, B, C of the question, when he falls into such an elementary pitfall. If he had been in this House a few years ago he would have known that I introduced the question of the title "Dominions," but, with the usual supercilious style of the Front Bench, I was sneered at for months until the so-called "Colonies" and Dominions backed up my demand, and they were forced at last with bad grace to give way. The word "Imperial" should stink in the nostrils of history and of all except those who are saturated with pro-German sentiments. There is one, and only one, great example of an Empire since the Roman Empire which, under the word "Empire," has fallen into rottenness and corruption, and that is the German Empire. The word "Imperial" reeks of a sentiment which was prevalent here before the War, especially in Tory circles, and it found voice at the beginning of the War. It was said, "No; it is not the German Empire which will rule the world with their Germanic ideas and their German Kaiser; it is we, the great English people, who will dominate the world and set our heel on other nations and trample them down under the great spirit of Imperialism."

*Mr. SPEAKER*

I am afraid the hon. Member is wandering from the Amendment. This is a very small Amendment, and lies within a very small compass. The hon. Member must confine his remarks to it.

*Mr. LYNCH*

All this arises from the word "Imperial." If I am wrong in wandering, my hon. Friend (Mr. Billing) was also wrong in introducing this word, and his speech wandered as far from the mark as you, Sir, say I am wandering now. I intend to continue to protest against the use of the word "Colonies," preferring to call them Dominions until we can proceed to a word of greater glory as opposed to this miserable and imitative idea of Imperialism, which is unworthy of us and certainly unworthy of the Dominions, whose destiny it is to be a federation of free republics.

*Mr. BILLING*

May I take this opportunity—

*Mr. SPEAKER*

The hon. Member is not entitled to speak again.
Amendment negatived.

*Mr. BILLING*

Am I not in order in rising to withdraw an Amendment?

*Mr. SPEAKER*

The hon. Member did not say that.

*Mr. BILLING*

I said I would take this opportunity and then you called me to order.

*Mr. SPEAKER*

I took the opportunity of putting the Question.

*Mr. BILLING*

Can I withdraw the Amendment?

*Mr. SPEAKER*

The Amendment has been negatived.

*Mr. BILLING*

I beg to move to leave out the word "Force," and to insert instead thereof the word "Service."

The term "Air Force" is an unhappy one, because it does not roll easily off the lips and its initials do not help in any way. I should like to qualify the suggestion that this body is to be purely a force. It is rather more a service than a force. It is a service which, I hope, is going to bring victory to our arms. I do not know of any other means of getting it in the present condition of the world. After the War I trust it is going to be a force in a punitive sense only, and that it will be more of a service to mankind than a force for the purpose of making war. Although the aeroplane itself is the most punitive weapon that has ever been placed in the hands of man to wield, it is also, from that very cause, most likely to bring to this world universal peace, because the only way to keep people quiet, whether it is an individual or a collection of individuals, or a collection of nations, is to have in one's hand a punitive weapon by which to exert authority in the interests of justice and peace. [An HON. MEMBER: "In other words, force!"] This country, whether it be an Empire or purely a country, is not going in times of peace to spend the vast sums of money which are and will be necessary to keep up the establishment of any force worthy of the name, and one likely to keep us on even terms with potential enemies, without

turning it to some other use in peace time. The life of an aeroplane is only about four days in war. In peace time possibly it becomes obsolescent in from six to twelve months. We are passing through stages of development in aviation, and shall be for the next ten years, which render that certain. It is necessary that whatever force or service we have shall keep up with the very latest types of machine in ever respect.

Despite the fact that this War has been going on for three and a half years, I hope the future will bring more years of peace than of war. Therefore, it would be better to call this a Service, because we look to it in times of peace to serve mankind in a constructive capacity and in times of war to serve the nation in a destructive capacity. Before very long the aeroplane, in the hands of capable men, with a nation or nations united behind it, will make war so terrible that no statesman or body of statesmen will dare to commit any country to a state of war. Its effect will be at once so sudden and so complete, its powers of destruction so enormous, that it will be able to lay cities in ashes in a night. Although the aeroplane comes to us as a weapon of force, we shall live to regard it as a winged messenger of peace. Great developments will take place, but they will be developments in the interest of humanity, and the function of the aeroplane will be, in the first place, to serve mankind, and, in the last resort, it will be used for punitive measures. I hope that the hon. Member in charge of the Bill will accept the Amendment. We have used it in the Navy as the Royal Naval Air Service is never called the Royal Naval Air Force. The Royal Flying Corps was never called a force. The destinies of these two great Services, which have rendered such extraordinarily valuable assistance, are going to be merged in this new force. I trust it will be called by a name which will fall kindly from the lips and which will suggest that it will work for the service of mankind rather than its destruction.

*Mr. LYNCH*

I beg to second the Amendment. My hon. Friend has often good ideas, and in this deserves encouragement.

## CLAUSE 2.—(Government, Discipline and Pay of Air Force.)

*HC Deb 16 November 1917 vol 99 cc747-9*

*Mr. SPEAKER*

The next two Amendments on Clause 2, standing in the name of the hon. Member (Mr. Billing), dealing

*Major BAIRD*

I did not feel sufficiently impressed by the Amendment to think. it worth while to change the Title of the Bill. This is essentially a force that we propose to raise. We hope it will be a very formidable force. The hon. Member (Mr. Billing) referred to the existing Royal Naval Air

Service and the Flying Corps. Both these are very good names. Now that we have taken over both of them, either would have just cause to resent it if you gave the united force the name of the other. These are little things which people have to pay attention to. It appeared more reasonable to adopt a name which is not in use by either branch of the Air Force at present and to call it what it really is, an Air Force. I trust the Amendment will not be pressed.

*Mr. BILLING*

I do press it.

Question put, "That the word 'Force' stand part of the Bill."

The House divided: Ayes, 90; Noes, 0.

*[record of vote abridged]*

## CLAUSE 3.—(Transfer and Attaching to Air Force of Members of Naval and Military Forces.)

*HC Deb 16 November 1917 vol 99 cc749-78*

[record of debate abridged]

## CLAUSE 6.—(Air Force Reserve and Auxiliary Force.)

*HC Deb 16 November 1917 vol 99 cc779-84*

*[record of debate abridged]*

## CLAUSE 8.—(Establishment of Air Council.)

*HC Deb 16 November 1917 vol 99 cc784-812*

(1) For the purpose of the administration of matters relating to the Air Force and to the defence of the Realm by air there shall be established an Air Council consisting of one of His Majesty's Principal Secretaries of State, who shall be President of the Air Council and of other members who shall be appointed in such manner and subject to such provisions as His Majesty may by Order in Council direct.

(2) His Majesty may, by Order in Council, fix the date as on which the Air Council is to be established, and make provision with respect to the proceedings of the Air Council and the manner in which the business of the Council is to be distributed among the members thereof.

(3) On the establishment of the Air Council the Air Board constituted under the New Ministries and Secretaries Act, 1916, shall cease to exist, and all the powers, duties, rights, liabilities, and property of that Board shall be transferred to the Air Council, but nothing in this: Sub-section shall affect any orders, instructions, or other instruments issued by the Air Board, and all such instruments shall have effect as if issued by the Air Council.

(4) His Majesty may, by Order in Council, transfer from the Admiralty or from the Army Council or the Secretary State for the War Department, to the Air Council or the President of the Air Council such property, rights, and liabilities of the Admiralty or Army Council or Secretary of State as may be agreed between the Air Council and the Admiralty or the Army Council, as the case may be.

3.0 P.M.

*Mr. BILLING*

I beg to move, at the, end of Sub-section (1), to insert the words "It shall be lawful for the Board of Admiralty and the Army Council respectively to nominate an associate member for the Air Council, which members shall have the right to take part in all, discussion and vote on all measures."

It has not been made very clear exactly what are the powers of the Air Service. It has not been made very clear whether the Air Council will retain control, either direct or indirect, of the members of the Air Service who are attached to the Grand Fleet or to the Army respectively; and it has not been made clear at all whether the guns and machines and the flying officers of the Navy who decide not to avail themselves of transfers or attachment are to be permitted by or under the Admiralty to carry out the functions of gun-spotting or scouting for the Grand Fleet. There is nothing in this Bill, so far as I can see, to prevent the Lords of the Admiralty building an aeroplane and asking one of their officers to fly it in the interests of the Grand Fleet. This Amendment is down to provide that on the Air Council which it is proposed shall have control over, or at least a certain right of interference with, the aeronautical impedimenta, on sea or land, with the Army in the field or the Grand Fleet respectively, the Army and the Navy shall have a representative on that Council to make representations to the Council in the interests of the Grand Fleet and the Army respectively. I utterly fail to see if this Amendment is not accepted on what grounds it is rejected. Surely, on the ground of common sense, in starting a new Service such as this, it would be as well to have the service in an advisory capacity of a senior officer of the Army and Navy respectively on all matters of strategy and on all matters of the ordinary conduct of their force, because—so far as I can see nothing that has been stated from the Front Bench has led us to consider the contrary—anybody may be a member of this Air Council. It is even suggested and advocated by the representative of the Government that certain tradesmen shall form part of this Council, and shall busily continue their work of directors of a firm who are trading with the Council. Tradesmen are very fine fellows in their way, but when it comes to strategy or the administration of affairs

of a great new Service, I should not recommend tradesmen only; I should say that we must have the advice and assistance, as associate members, if you wish—I distinctly provide in my Amendment that they should be associate members and not permanent members—of high officials of considerable experience from the two Services respectively.

One hon. Member referred this afternoon to the attitude of Lord Northcliffe so far as this Air Council is concerned. Hon. Members may have varying opinions as to the ability and methods of Lord Northcliffe, but one thing I am perfectly certain about is that he possesses energy and enterprise. He may have good reasons for refusing the position, but I am confident that if he had accepted it he would have been most anxious to have had naval and military associates on that Council. The fact that he has refused the position suggests to me that they have refused to give him a free hand. I am in favour of seeing the Air Minister, for better or worse, with a free hand, subject always to such advice as the Council could render to them. Nothing can be said against having associate members attached to this Council. To suggest that it would cause friction is nonsense. I say that it will defeat friction, intrigue, and inefficiency in their early stages. Let us assume that the Admiralty are anxious for another squadron of machines or for the development of one particular type of machine in the interests of the Grand Fleet. The Grand Fleet have suffered at the hands of German airships. Up to recently they have been blind. We are proposing to take all that away from the Grand Fleet again, to transfer it all to the Air Service, and we leave it to the new Air Minister to blind the Grand Fleet. He will not do it, of course, but he will have his own ideas. There are two schools in the Air Service, the lighter-than-air school and the heavier-than-air school. A lot of confusion will arise. I can almost hear now the arguments that will be put forward by the airship experts of the Admiralty, when the Air Service is transferred, to show that the Air Council should supply the Navy with lighter than air machines. I can equally hear the arguments put forward for heavier than air machines.

I suggest that this Council should have upon it one naval representative who can attend the deliberations of the Council and put forward the views of the Admiralty, while the consultation is taking place and before a definite decision is come to, because the tragedy of officials is that, having decided, rightly or wrongly, they think that they are becoming smaller men instead of greater men in the opinion of others if they withdraw their opinion in face of evidence which justifies that withdrawal. The Army and the Fleet will require extraordinary assistance from the Air Service. They will actually constitute the Air Service during the first few months, if not the first year of its career, because, despite the transfer and calling it by a different name, of the men, Officers, machines and materials employed under the direction of the Air Service about 75, or, at any rate, 60 per cent. will be in the hands of the Army until such period as all these delicate questions of control, distribution, machines, the use to which they are to be put, and the development experiments which are necessary for a complete understanding of the possibility of the employment of aeroplanes in connection with naval and military forces are settled. It would be a tragedy if all these things are placed in the hands of a Council which had no naval or military adviser upon it. If it were purely and simply in the hands of the

Council to have the direction of a great raiding squadron, possibly this Amendment would not be so important, but as it is proposed that this Council shall affect and is requested to work in harmony with the two great Services the Army and Navy, I consider that it will be a very serious matter if this Amendment is lost.

*Mr. HARCOURT*

I beg to second the Amendment.

*Major BAIRD*

I cannot accept this Amendment. The Government are fully alive to the necessity of keeping the closest possible touch between the Army and Navy and the Air Forces. It has been stated quite clearly that the main business of the Air Council would be to co-ordinate the Air Forces of the two Services. The hon. Member did not appreciate the competition of the Air Council as it is now proposed. This Council will discharge its duties in relation to the Army and Navy, and obviously means will have to be taken to keep the closest possible touch between all three Services. I do not think that the method suggested by the hon. Member is necessarily the best method. There is nothing whatever to stop the Air Council inviting the Admiralty and the War Office to send representatives to consult with them. Undoubtedly consultations will be of daily, indeed, hourly occurrence, but it is essential in the interests of efficiency to leave it to the Air Council to decide the best methods to adopt.

Question put, "That those words be there inserted in the Bill."
The House divided: Ayes, 0; Noes, 143.

*[record of vote abridged]*

*[record of debate abridged]*

## CLAUSE 11.—(Provisions as to Sitting in Parliament.)

*HC Deb 16 November 1917 vol 99 cc812-26*

*[record of debate abridged]*

Motion made, and Question proposed, "That the Bill be now read the third time."

*Mr. LYNCH*

I desire to place myself deliberately on record as saying that this Bill has failure stamped on its face. Even now I would advise the Government to take that view, tear it to shreds, and bring in a new and an effective Bill. The majority of the few Members who have been present during this Debate are prospective or possible office-holders under the Bill. I know of no occasion during the last three years or more that have elapsed since the beginning of this terrible War—which, remember, up to date the Allies are not winning—I know of no measure presented by

the Government, no matter how futile it has proved, which has not met the approval of the majority of the House, and which has not been presented by the member of the Government with that same air of unctuous rectitude with which they have ushered in this Bill.

I have a right to speak upon this subject, because years ago, and for many months absolutely alone, I have asked, implored, demanded again and again from the Government that they should produce a Bill which would constitute an Air Ministry. I have been received even with derision.

*Mr. PRINGLE*

Counted out !

5.0 P.M.

*Mr. LYNCH*

A Nemesis has arisen, but that Nemesis has not come to cover me with the impression that it stands in accusation before the Government. To touch upon past history for the moment, I was impelled to this course by a clear vision, which has been fully justified, of the great and imminent peril which was presented by the possibility of an Air Service on the part of the Germans. I implored the Government to wake up in time and to recognise this great peril and to prepare something effective to meet it. But my appeal fell upon deaf ears; deaf ears, but always with a show of profound wisdom and total omniscience, which again and again I have discovered to exist on that bench with abysmal incapacity. What I will say now is this: If at one time an Air Service of even 10,000 aeroplanes had been created it might have proved decisive in this War; but time rolls on, months roll by, and whereas at one epoch a fleet of 10,000 planes might have retrieved the position now ten times 10,000 planes may prove insufficient.

Remember what the Germans are doing. They at last have wakened up to all the possibilities of air attack. Luckily for all of us they were hypnotised by their great Zeppelin "idea," an idea which though it has rendered large service has yet proved disappointing to their hopes, but now they have changed their methods entirely; they have determined, to use a popular phrase, to go nap on an air service. They have not begun by bringing in a ramshackle Bill, such as will break the impulsion of the man placed in charge of the measure and which in many respects bears the aspect, in a great crisis, not of meeting a menacing external problem but rather as being one of those measures with which we are familiar, which are intended to satisfy this House for the moment and to be a sop to the cerberus of the Press. The Germans have at the head of their business one man of considerable experience, of real enthusiasm, of great driving power, and they have instructed him to the full with all the powers for executing boldly, decisively, and quickly the conceptions which emanate from his brain. I see nothing in this Bill that will meet the machinations of Hoeppner at the head of the German air service.

Remember this. That great as has been the peril with which we have already been menaced, I at any rate see the possibility—I hope it is only a possibility—which far exceeds in magnitude and danger anything which we have yet experienced, and we do not get rid of this possibility by the opium dope of optimism. We are dealing with something analogous to the forces of nature, where our own state of mind has no influence on the result. We have been faced with the great external problem which is becoming more and more menacing, and when I kept pressing again and again for this measure I hoped that at length, having wakened up to the dread reality the importance of which cannot be magnified, this Government would have realised that this was perhaps the one avenue that remained to final victory. I hoped that, recognising this, those in charge of affairs would rise to the height of the occasion and plank their very existence on great, bold, decisive, and adequate measures. I thought they would recognise the futility, to say nothing else, of those incessant attacks of which they have been so proud on the Western front, that they would abandon their attempts to break through the Hindenburg line; that they would close that chapter, and save the consequent waste of men and material, and by the economy so effected have acquired greater power to concentrate on the Air Service. I had hoped that they would have created something in the style of a Napoleon Bonaparte. Whenever such a name is mentioned in this House it creates an impression of a Triton among the Minnows. But remember that, after all, he was the representative of a country which has been considered decadent up to the last three years, and that he lived a hundred years ago. What is the meaning of that greatness of a hundred years ago? What is the meaning of civilisation and enlightenment; and what is the meaning of your continual boasts in history if, at the great crisis, you are unable to produce a Man. You have not produced that man, and you have not produced adequate measures to face that great peril which is now menacing your very existence

Consider another aspect of this question. Who is going to be the Secretary of State? Whom are you going to entrust with the execution of this measure which is vital to the very safety of the country? What names are there mentioned? Is it the name of a great engineer? Is it the name of any man who has already stood forward before the public as one possessing bold ideas, great energy, great intellectual powers? That does not seem to be your method for searching for a man. You search for some journalist who has either the power to menace you or who has the talent to "boom" you. Are you going to put Mr. Bottomley in charge of this measure? [Laughter.] That suggestion excites laughter, but it is quite on a par with all the previous acts of this Government in the formation of successive Cabinets in the crises where the life of the nation have been threatened. Or if not Mr. Bottomley, will you put Mr. Smillie in charge of this measure? I do not know that either Mr. Bottomley or Mr. Smillie know anything about aeroplanes. It is possible that they may have studied these problems, that they may have devoted their great powers to the study of these problems, and that they are well acquainted with all that is necessary to fill such a post. The point is that they would not be chosen for that competence or for that efficiency, they would be chosen for Parliamentary reasons in order to secure this Government from attacks, or to bolster up still further, by Machiavellian methods, the majority which they enjoy in this House. I would remind the House, and particularly I would remind the country—because, if my words should even fail

to go home now they will return with twentyfold force six months from this date, and will sink into the minds of people outside—it is one thing to satisfy this House, it is one thing to have a powerful Press tuned to action, just as Queen Elizabeth tuned the pulpits, to sound your praises in chorus; it is one thing to create an optimistic spirit; it is one thing to bolster up the reputations of men who are essentially small men and incapable men—all that lies on one side of the question; on the other side, once again, is that great menacing exterior problem which you have never faced frankly, sincerely, and resolutely, which is pressing on your attention again and again, which is becoming more and more urgent, and which I say this Bill is totally inadequate to meet. In order to put my opinion definitely on record I would vote against this Bill—

*Major BAIRD*

rose in his place, and claimed to move, "That the Question be now put."

Question put, "That the Question be now put."

*Mr. BILLING*

(seated and covered): The Closure has been put before any but one Member has had an opportunity of speaking on this Bill. During the whole course of this Bill, from Committee stage to Report stage, the discussion has been kept as carefully as possible within the strict procedure, and, if not, any matter was at once ruled out. In Committee stage the Chairman of the Committee ruled out my new Clauses, because he said they ought to have been Amendments. When we came to the Amendments, he ruled them out because they ought to have been new Clauses. The whole political trickery that it is possible to put into motion has been put into motion on this Bill, and now Members are coming from the smoking rooms and the tea rooms and crowding into the Lobby to vote, although they have not the least idea what they are voting for.

*Mr. SPEAKER*

That is not a point of Order.

*Mr. BILLING*

On the point of Order. May I ask you whether, before Members have even had an opportunity of signifying their desire to speak by rising, it is in order for a man to be put up by the Government after the first opening phrases of the first Member who rises to address the House on the Third Reading? I consider it a most improper proceeding.

*Mr. SPEAKER*

The hon. Member will have an opportunity of voting against it.

*Mr. BILLING*

Am I to understand that all this legislation is to be so conducted that there is to be no criticism, and that the only method which an hon. Member has to register his protest against this abominable form of Government is to vote against Bills for the conduct of the War?

*Mr. SPEAKER*

The hon. Member has occupied a great part of the day in making protests. Almost the whole time has been taken up to-day by his speeches.

*Mr. BILLING*

May I ask your ruling on this matter? The only reason I have taken up the time of the House is that other Members have neither the intelligence nor the patriotism to attend the Debate. There was not a London Member present.

*Mr. SPEAKER*

Is the hon. Member prepared to tell or not?

*Mr. BILLING*

Yes.

The House divided: Ayes, 136; Noes, 0.

*[record of vote abridged]*

Question put accordingly, and agreed to.

Bill accordingly read the third time, and passed.

The remaining Orders were read, and postponed.

Whereupon Mr. Speaker adjourned the House without Question put, pursuant to Standing Order No. 3.

Adjourned at a Quarter after Five o'clock.

http://hansard.millbanksystems.com/commons/1917/nov/16/air-force-bill

# Air Force Constitution Act, 1917.

[7 & 8 Geo. 5. Ch. **51**.]


## ARRANGEMENT OF SECTIONS. A.D. 1917.





Air Force Constitution Act
website: http://www.legislation.gov.uk/ukpga/Geo5/7-8/51/contents

34—67

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*Not to be communicated to anyone outside H.M. Service.*

# AIR MINISTRY WEEKLY ORDERS.

AIR MINISTRY,
10*th April* 1918.

The following Orders are hereby promulgated for information and guidance and necessary action.

By Command of the Air Council,

**W. A. ROBINSON.**

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## 34.—Telegram from His Majesty the King on the Inauguration of the Royal Air Force.

The following telegram from His Majesty was received by the President of the Air Council on the occasion of the inauguration of the Royal Air Force :—

Lord Rothermere,
Air Ministry, Strand.

"To-day the Royal Air Force, of which you are Minister in Charge, comes into existence as a third arm of the Defences of the Empire. As General-in-Chief I congratulate you on its birth, and I trust that it may enjoy a vigorous and successful life.

"I am confident that the union of the Royal Naval Air Service and the Royal Flying Corps will preserve and foster that esprit de corps which these two separate forces have created by their splendid deeds."

GEORGE, R.I.

1st April 1918.

The following reply was sent to His Majesty by the President of the Air Council :—

"Lord Rothermere, with his humble duty to Your Majesty, begs leave on behalf of the Royal Air Force, to convey an expression of their heartfelt appreciation of the gracious message addressed to them by their General-in-Chief.

"Lord Rothermere is confident that the assurance of your Majesty's interest and confidence will assist every officer and man in the R.A.F. in the task of continuing the great traditions of the R.N.A.S. and R.F.C., traditions which, as your Majesty has personally seen, have never been more gloriously maintained than in the struggle now proceeding."

Telegram from His Majesty the King on the Inauguration of the Royal Air Force

Lord Rothermere and Air Vice Marshall Sykes, et al

## 617.—Light Blue Uniform for Officers.

1. Approval having been given for certain changes to be made in R.A.F. uniform, A.M. Monthly Order No. 162 is amended, so far as Officers' uniform is concerned, as laid down below.

2. Officers in possession of khaki uniform of the pattern authorised by the above Order may continue to wear same until it becomes necessary to renew it. Light blue uniform of the pattern laid down below must then be provided.

3. Light blue uniform, already authorised by above quoted Order for evening wear, may be taken into use forthwith for general wear, but must first be modified to conform in detail to the patterns described below.

4. No specific grant in respect of blue uniform will be made.

5. Description of Light Blue Uniform for Officers.

Cap.—Of the same design as the present R.A.F. khaki cap, but with light blue crown.

Cap Badge.—For all ranks below Major-General as at present. Officers of the rank of Major-General and above will wear a special Cap Badge, consisting of a wreath of laurel leaves, surmounted by crown and lion, with gilt metal bird superimposed on the laurel wreath.

Rank Distinctions on Cap.—The vertical bars now worn on either side of Cap Badge by Officers below rank of Major will not be worn on blue caps.

Field Officers will wear one row of gold oak leaves and General Officers will wear two rows on peak of cap as at present.

Jacket.—The pattern is the same as that at present authorised for khaki, but the material is of light blue cloth.

*Buttons.*—The same design as at present authorised, but flat, and of gilded metal, without "rope" edge.

*Buckles.*—The same type of buckle will be worn on belt, but with two prongs instead of one.

*Badges of Rank.*—The "Bird and Crown" at present worn on cuff is abolished. Badges of rank are as at present authorised, but in gold lace instead of worsted braid.

**Note.**—Second Lieutenants will now wear the "half row" of gold lace.

*Distinctive Badges.*

*Pilot.*—"Wings" of the present pattern but in gold and silver embroidery.

*Observer.*—"Single Wing" of the present pattern, but in gold and silver embroidery.

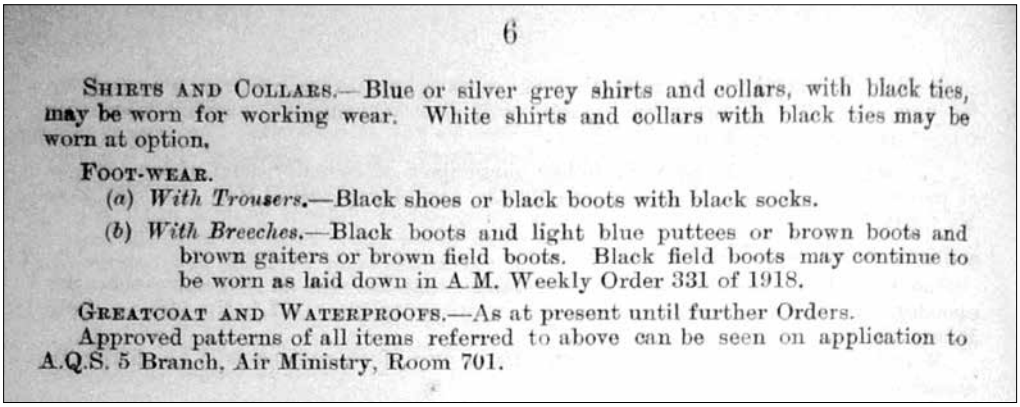
*Service Chevrons.*—Will no longer be worn in R.A.F.

*Wound Badges.*—Gold-embroidered stripes of the pattern worn in Navy and Army.

Trousers.—Of the pattern at present authorised, but of light blue cloth.

Breeches.—Of the pattern at present authorised, but of light blue material. Strappings if worn will be of the same material as breeches.

The First Royal Air Force Uniform Page 1



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SHIRTS AND COLLARS.—Blue or silver grey shirts and collars, with black ties, may be worn for working wear. White shirts and collars with black ties may be worn at option.

FOOT-WEAR.

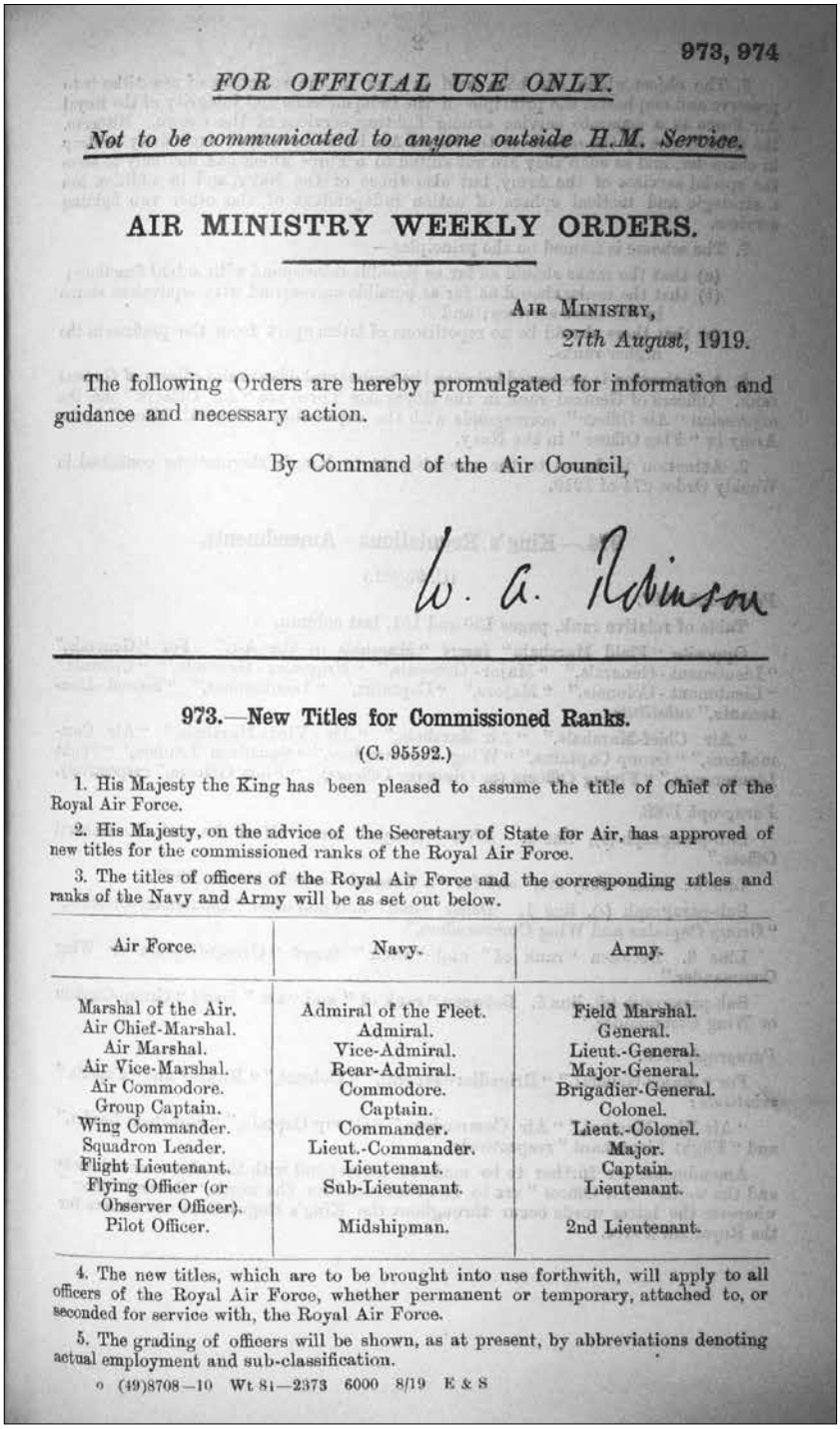
(*a*) *With Trousers.*—Black shoes or black boots with black socks.

(*b*) *With Breeches.*—Black boots and light blue puttees or brown boots and brown gaiters or brown field boots. Black field boots may continue to be worn as laid down in A.M. Weekly Order 331 of 1918.

GREATCOAT AND WATERPROOFS.—As at present until further Orders.

Approved patterns of all items referred to above can be seen on application to A.Q.S. 5 Branch, Air Ministry, Room 701.

The First Royal Air Force Uniform Page 2



973, 974

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# AIR MINISTRY WEEKLY ORDERS.

AIR MINISTRY,
*27th August*, 1919.

The following Orders are hereby promulgated for information and guidance and necessary action.

By Command of the Air Council,

W. A. Robinson

## 973.—New Titles for Commissioned Ranks.

(C. 95592.)

1. His Majesty the King has been pleased to assume the title of Chief of the Royal Air Force.

2. His Majesty, on the advice of the Secretary of State for Air, has approved of new titles for the commissioned ranks of the Royal Air Force.

3. The titles of officers of the Royal Air Force and the corresponding titles and ranks of the Navy and Army will be as set out below.

| Air Force. | Navy. | Army. |
|---|---|---|
| Marshal of the Air. | Admiral of the Fleet. | Field Marshal. |
| Air Chief-Marshal. | Admiral. | General. |
| Air Marshal. | Vice-Admiral. | Lieut.-General. |
| Air Vice-Marshal. | Rear-Admiral. | Major-General. |
| Air Commodore. | Commodore. | Brigadier-General. |
| Group Captain. | Captain. | Colonel. |
| Wing Commander. | Commander. | Lieut.-Colonel. |
| Squadron Leader. | Lieut.-Commander. | Major. |
| Flight Lieutenant. | Lieutenant. | Captain. |
| Flying Officer (or Observer Officer). | Sub-Lieutenant. | Lieutenant. |
| Pilot Officer. | Midshipman. | 2nd Lieutenant. |

4. The new titles, which are to be brought into use forthwith, will apply to all officers of the Royal Air Force, whether permanent or temporary, attached to, or seconded for service with, the Royal Air Force.

5. The grading of officers will be shown, as at present, by abbreviations denoting actual employment and sub-classification.

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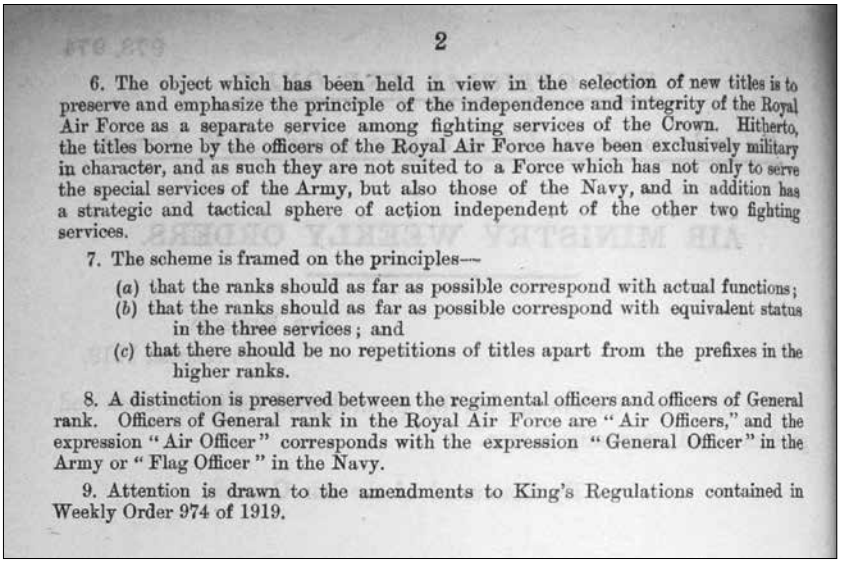
The New Royal Air Force Ranks Page 1



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6. The object which has been held in view in the selection of new titles is to preserve and emphasize the principle of the independence and integrity of the Royal Air Force as a separate service among fighting services of the Crown. Hitherto, the titles borne by the officers of the Royal Air Force have been exclusively military in character, and as such they are not suited to a Force which has not only to serve the special services of the Army, but also those of the Navy, and in addition has a strategic and tactical sphere of action independent of the other two fighting services.

7. The scheme is framed on the principles—

(*a*) that the ranks should as far as possible correspond with actual functions;
(*b*) that the ranks should as far as possible correspond with equivalent status in the three services; and
(*c*) that there should be no repetitions of titles apart from the prefixes in the higher ranks.

8. A distinction is preserved between the regimental officers and officers of General rank. Officers of General rank in the Royal Air Force are "Air Officers," and the expression "Air Officer" corresponds with the expression "General Officer" in the Army or "Flag Officer" in the Navy.

9. Attention is drawn to the amendments to King's Regulations contained in Weekly Order 974 of 1919.

The New Royal Air Force Ranks Page 2

# REVIEW

OF

# AIR SITUATION AND STRATEGY

FOR THE INFORMATION OF THE

# IMPERIAL WAR CABINET

BY

THE CHIEF OF THE AIR STAFF

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AIR MINISTRY
*June 27th, 1918.*

# CONTENTS

# I
# GENERAL CONCLUSIONS AND RECOMMENDATIONS IN REGARD TO AIR FORCE POSSIBILITIES AND REQUIREMENTS

History has shown that although the fundamental principles of strategy do not change, the methods of their application vary constantly. That Commander is successful who is able to recognise quickly the needs for new methods and to create and apply them without delay. In formulating strategy the first consideration, therefore, is to weigh any new factors which may have emerged. There are three new factors: the national aspect, the air, and the submarine.

This war, unlike previous wars, is in the fullest sense a war of nations. The entire population, and the whole weight of the resources and industries of the opposing nations, are thrown into the balance. The success of the armies or fleets entirely depends upon the energy and morale of the nation supporting them. As the outposts of an army are to the main body, so is the trench line of to-day to the nation.

What may be termed "battering-ram tactics" both on the part of the enemy and on ourselves appear to have been the prominent feature of the strategy of the war. On both sides the resources of the opposing nations have been thrown into the crucible. Armies have been piled up against armies. The national production of material and munitionment of the one side has been countered by approximately equivalent effort on the other.

There has been an unparalleled expenditure of the resources of the two civilisations. At the present time this competition is still in progress. The avowed aim of our strategy to-day, as well as that of our opponents, may be summed up in the words "national attrition". There is no need to dwell here upon the ultimate results of such warfare, but there is urgent need to consider whether there is any alternative; whether victory may be achieved by any other means.

The second great new factor is the air.

The Air Force has shared in the enormous mutual expansion referred to, but without appreciable margin for what may prove to be its most important function and sphere of utility: really long-range action. It has been an auxiliary arm, co-operating with the army and navy, aiding the artillery, substituting older methods of reconnaissance, &c. It is true that this defensive rôle has been carried out offensively, that is to say that effort has invariably been made, and with a large measure of success, to carry the war into the enemy's country; nevertheless, on a general view, the strategy of the Air Force has been confined to what the French aptly term the "zones of the armies", to protective work on the seas, and to home defence; in a word, the operations of the Air Force hitherto have been essentially defensive.

This offensive-defensive air strategy has been valuable from a strategic viewpoint because it has entailed a maximum pressure upon the enemy and has placed down to battle zones most

of the enemy's aerial resources. The net result has been that he has not been able to spare air force for strategic attack on any considerable scale. This is a clear gain and its great value is obvious, but it must be borne in mind that by offensive action alone can decisive results in war be obtained.

The superior industrial resources, and consequent powers of munitionment of the Allies, have now brought within reach the possibility of definitely changing the character of air strategy from the defensive to the offensive by adding the direct long-range offensive to the present defensive rôle. It is the intention of the Air Staff to bring about this change with the least possible delay, and to carry out a vigorous offensive against those root industries upon which depend the entire naval and military endeavour of the Central Powers. This strategy will in fact be a form of "strategic interception". This consists in holding down the enemy's forces in the field, while simultaneously striking at his lines of communication, bases of supply well in rear, and in addition aiming to break down the moral of his nation.

"Strategic interception" has not been frequent in history owing to the great relative skill demanded of the leader, combined with great mobility and efficiency of the troops under his command. It is the ideal strategy for the new arm – the Air Force.

The present war certainly can only finally be won on land. Territory must be occupied, and towns held by troops. The necessity of maintaining adequate air forces to co-operate with our navy and armies is not lost sight of. That is an essential component of the strategy outlined. But it is urged that we have it within our power to ensure sufficient defensive air strength and to build up at the same time a strong long-range arm, a striking force to carry out such an offensive as may indeed pierce into the moral and physical centres of the enemy's being.

Trials are being carried out with an aeroplane which has an estimated range of 1,100 miles, ie 550 miles each way, and a carrying capacity of 4,000 lbs. Reduce these estimates for practical purposes to 800 miles and to 3,000 lbs respectively and we still have a weapon which can achieve great results. But, apart from this machine (the trials of which are not yet completed) we have in action at the present moment a machine, which if produced in sufficient numbers, and handled scientifically, can completely dislocate, operating from its present base, some 40 per cent of the total iron and 50 per cent of the total chemical industries of Germany.

A review of the possibilities of strategic attack by long-range striking forces of aircraft results in the inevitable conclusion that such attacks, if carried out in sufficient strength, will achieve the following results in the shortest time:

(a) Dislocate the Munition industries which lie at the root of all German military endeavour, and thus paralyse the German military machine.

(b) Deal a heavy blow at the submarine, and so afford a tremendous assistance to a more complete sea supremacy.

(c) Bring about far-reaching moral and political effects in Germany, the heart and brain of the Central Powers.

The conclusions arrived at are:

That the development of air power affords the best and most rapid return for the expenditure of national resources of man-power, material, and money.

That, as the offensive is the dominant factor in war, so is the strategic air offensive the dominant factor in air power.

That the air power of the Allies, if developed, organised, and co-ordinated, can be accepted even now as the most probable determining factor for peace.

### Recommendations

1. That priority shall be given to men and material for the Royal Air Force.

2. That Naval and Military Air requirements shall be cut down to a minimum consistent with the maintenance of air supremacy in the battle zones, in order that the long-range Striking Force of air power shall be developed as rapidly as possible.

3. That every effort shall be made to induce the Allies to fall into line with this policy.

## II
## EMPLOYMENT OF AIR FORCE ATTACHED TO ARMIES

The supreme necessity of aircraft to an army, whether in attack or defence, in modern warfare, is a point which does not at this time require to be reviewed.

The Royal Air Force is called upon to co-operate with armies in an ever-increasing number of rôles – Reconnaissance, photography, observation of artillery fire, location of hostile batteries, contact patrols with infantry, counter-attack patrols, bomb attacks on communications, and – a rôle which has recently much increased in importance – machine-gun and bomb attacks on enemy troops and transport by large concentrations of machines flying at low heights, anti-tank defence, inter-communication – these duties are indispensable to an army in the field, and are regularly carried out.

It is not possible within the scope of this paper to describe in any detail the large and ever-

increasing work of the Royal Air Force co-operating with the armies in the field. A fuller review of this aspect is given in Appendix "A".

Aircraft are at present co-operating with our armies in France, Italy, Salonica, Palestine, and Mesopotamia. In India there is a small nucleus of air force consisting of about 1½ squadrons available to co-operate on the frontier. It is interesting to glance at the growth of the Air Service in these various theatres. In 1914 we had in France a total of four squadrons, to-day there are 74, with their innumerable necessary auxiliary units. Elsewhere in 1914 there was nothing except a single flight of aeroplanes which was collected locally in Egypt. Egypt has formed the nucleus of expansion of the Middle East. There are 11 training squadrons and flying schools in that country, and this number is now being increased to a total of 21. There are also large repair bases, a considerable aircraft depôt, two aircraft parks, and three wing repair sections. In Palestine there are five squadrons, in Salonika three squadrons, and in Mesopotamia three squadrons. With the exception of Palestine, which is dependent upon Egypt for supply, these theatres have their own aircraft parks and other echelons of supply and repair. Egypt has also detached flights during the past two years to co-operate with the King of the Hedjaz in Arabia, with the Egyptian Army in Darfur, and with troops operating against the Senussi in the Western Desert.

The squadron which carried out so much useful work in East Africa was withdrawn last summer. The greater part of the personnel for this squadron was supplied by South Africa.

Italy is a comparatively new theatre. A brigade of the Royal Flying Corps accompanied the British troops which were sent there last September. This brigade was shortly afterwards reduced to a wing of four squadrons. It has been of the greatest value to the Italian armies and to our own troops in Italy during the present fighting.

## III
## EMPLOYMENT OF AIR FORCE ATTACHED TO SEA FORCES

At the outbreak of war, the total strength of the Naval Wing, RFC, was a heterogeneous collection of 41 aeroplanes and 51 seaplanes, located at six different stations in Great Britain. Bases were shortly after established at Ostend, Antwerp, and Dunkirk, but with the exception of fitting out five makeshift seaplane carriers, which carried out one or two raids, no serious co-operation with the Navy was attempted in 1914.

Numerous additional stations were, however, established along the coast for patrol purposes, and a number of inland stations were provided for training and for the defence of London.

It was not until the Dardanelles Campaign, where the whole of the air work was carried out by Units of the Naval Wing, that any serious aircraft co-operation with the Fleet was attempted.

Turning to the present, as requires the Fleet, aircraft are now recognised as an essential auxiliary.

It may be laid down that already the importance of aircraft in a Naval action is that the Fleet provided with the more efficient and larger force may, although numerically weaker in surface vessels, at least escape defeat and possibly gain a victory.

There are now 14 aircraft carriers, and an ever growing number of battleships and cruisers are being fitted to carry one or more aeroplanes for reconnaissance of fighting work. The machines fly from the decks or tops of turrets. The total number of aeroplanes and seaplanes allotted to the Grand Fleet is 350. In addition, large flying boats are employed from Bases on the North and East Coasts for reconnaissance of the Heligoland Bight, or on patrol work over the northern barrage. At present 52 kite balloons are employed with the fleet on anti-submarine work and spotting for gun-fire, and this number is increasing.

The second great function of aircraft with sea forces is to assist in the anti-submarine campaign. The successful results obtained have led to the establishment of some 45 aeroplane and seaplane stations round the British Isles. The aggregate strength of those is 43 Flights of seaplanes, and 30 of aeroplanes.

There are also 9 large and 7 small airship stations, with a total of 76 airships of all types. These, except for the provision of personnel, are not under the control of the Air Ministry. It is the intention of the Admiralty to try and increase considerably the number of airships employed.

In the Dunkirk-Dover group eight aeroplane squadrons are at present employed, their work consists principally in bombing the submarine bases on the Belgian coast and in assisting to maintain the Dover barrage.

The present strength in the Mediterranean amounts to a total of six squadrons of aeroplanes and seaplanes. These are employed mainly on anti-submarine work, but reconnaissance and attacks on the Austrian bases and Dardanelles are also carried out. An airship station is established at Kassandra, and one is projected for Malta. A certain number of kite balloon stations have been established and more are projected with a view to the development of convoy escort work.

As regards the future it would appear that, owing to minefields and submarines, fleet action is very much hampered. It is hoped that the development of aircraft co-operation will give the fleet greater power of manoeuvre and thus facilitate its offensive rôle. The development of long range bombing attacks upon the enemy fleet bases will also have far-reaching results.

# IV
# EMPLOYMENT OF AIR FORCE AS A STRATEGIC STRIKING ARM

The first strategic striking force came into being in October last in the shape of three squadrons. It was established in response to a popular demand for air raid reprisals. These squadrons have been used chiefly against the German ironworks in the Lorraine basin and against the German chemical industries in the vicinity of Mannheim. The force is still too small to achieve important material results, but the moral effects of these reprisal raids has been considerable. It is also to be noted that these attacks have caused a marked increase in anti-aircraft defences, entailing the immobilising of personnel and materiel. This small force has been taken as one nucleus upon which, in accordance with the new policy of the Air Staff, it is proposed to build up a proportion of a great strategic striking force. Arrangements are also being made to form, as soon as possible, a second portion of this striking force which will operate from a base in Norfolk and will have a still wider range. It is hoped that considerable results will be obtained by the first of these forces by the end of this year and that both will be in really effective operation by June 1919.

The objectives of those forces may be classified as follows:

A. Attacks on sources of munition supply, with the object of crippling the enemy's land forces operating in every theatre of war, but firstly and more particularly on the Western Front.

B. Attacks on the submarine equipment factories and submarine shipbuilding yards, with the object of striking the submarine menace at its root.

C. Numerous attacks by small forces on all the larger cities of Germany with the object of obtaining the most widespread dislocation of municipal and industrial organisation.

Although it is convenient to bear in mind these three aims, the means of carrying them out will necessarily interact, and it will be difficult to assign any particular operation wholly to one or another.

As regards A, it is considered that the most important objective is to cripple the resources of the German armies in the field by attacks on root industries, which constitute the "bottle neck of production".

These industries in their order of importance are:

(a) The Chemical industry.

(b) The Iron and Steel Works.

(c) Machine Shops, &c.

A glance at the accompanying map (Appendix "C") *[not reproduced]* will show their positions. Two of the principal areas are within reach of the small strategic striking force now beginning to operate from Ochey. It is anticipated that all will be within reach of the new "V" type of Handley-Page machine which is about to appear. A few notes on these industries will be useful.

(a) *The Chemical Industry* which supplies all high explosives, propellants, poison gas, &c. The Mannheim and Frankfort Groups produce 50 per cent of Germany's total output, Leverkussen produces from 15 per cent to 20 per cent. These works, for many reasons, could not be duplicated out of range. They are particularly vulnerable and are not numerous. It is estimated that if the policy advocated by the Air Staff is followed, we shall be in the position completely to dislocate this industry by June 1919.

(b) *Iron and Steel Works.* A very large proportion of these are situated in the Briey-Longwy and Saar basins. They are within easy reach of the striking force operating from Ochey. The blast furnaces cannot be concealed and constitute beacons to guide night bombing formations.

(c) *Machine Shops.* These are situated particularly in the Westphalian district, which contains such towns as Essen (the main German Arsenal), Dusseldorf, Duisburg, Ruhrert, Oberhansen, Dortmund, Crefeld, Elberfeld, Bochum, Barmen, Hagun, Mullheim, Ruhr, and many other small towns – the whole concentrated in a small area.

In addition to the above main groups of targets, there are others, the destruction of which would cause dislocation of the German military machine. Among these may be quoted the Bosch magneto works at Stuttgart, where it is estimated 50 per cent of all magnetos used for aviation purposes are produced.

The bulk of aero-engines are made at Mannheim and Stuttgart.

With regard to B, Strategic attacks against the submarine menace. Practically the entire manufacture of accumulators for submarines is centred in two small groups of factories at Hagen and Berlin. An effective attack on those two factories would, it is estimated, entail a set-back to German submarine production for a period of at least four months.

A further series of targets consists of submarine bases and shipbuilding yards in the Heligoland Bight, namely: Wilhelmshaven, Bremerhaven, Cuxhaven, and Hamburg. All those would be within reach of the "V" type Handley-Page squadron operating from Norfolk.

As regards C. Widespread attacks to obtain dislocation. The aim of such attacks would be to sow alarm broadcast, set up nervous tension, check output, and generally tend to bring

military, financial, and industrial interests into opposition. For instance, the destruction of mercantile shipping and of the vast accumulation of merchandise at Hamburg would probably result in considerable pressure being applied to the military authorities. The wholesale bombing of densely populated industrial centres would go far to destroy the morale of the operatives. The bombing of Berlin would plunge the whole of Central Germany into darkness, and would result in a widespread and far-reaching demand for anti-aircraft defences – anti-aircraft guns, machine guns, balloon barrages, searchlights, &c, a demand which could only be complied with at the expense of the armies at the front. Such an operation would also entail a national outburst of criticism against the military air service administration.

After careful study of all the above considerations, and the present programmes of production and personnel supply, the following lines of action for the strategic bombing of Germany have been decided upon.

A certain amount of strength is necessary before a radical dislocation of industries is possible, and though this amount cannot be made available before the spring of next year, it is urged that much may and must be done this year. The advantage of attacking this year may be summarised as follows: The approach of winter will bring about a decline in the moral of all belligerents. Strategic attacks upon Germany will have their maximum moral effect at such a period, and will react favourably upon the Allies. If the present German effort fails the reaction in Germany will be very great. We should aim to synchronise strategic air attacks with this reaction.

The greatest effort will therefore be made to speed up in every possible way the development of the striking force in order to be able to strike before the winter.

It is proposed broadly that at first the Ochey force shall operate against the chemical industrial groups of Mannheim and Frankfort, and against the steel industries in the Lorraine basin. When the long-distance bombers begin to operate from England, attacks will be made on Hamburg and Berlin, and possibly upon Hannover, Cassel, and Madgeburg. These attacks will continue until sufficient strength is forthcoming to undertake systematic attacks upon root industries.

*Striking Balance*. See the accompanying map (Appendix "C") *[not reproduced]* Our most suitable bases for attacks on Southern Germany are situated in the Ochey and Verdun areas. The drawback to those areas is their very close proximity to the line. It is therefore proposed to select forward landing grounds in these localities and to construct the main bases further back at a safer distance from the local hostile bombing forces. The base in Norfolk has been decided upon for the following reasons. It is nearer Northern Germany, and machines operating from this base will not have to cross the line, and will consequently not be open to hostile aircraft attack, to the same extent as operating from a base in France. The machines are so large that the wings cannot easily be carried by rail, and a base in Norfolk will therefore be easier to

supply. The unstable conditions in France render it inadvisable to increase the already difficult cross-country communication to the Nancy area. The Norfolk base is well placed to meet all eventualities. It affords facilities for co-operation with the Army in France if that should become necessary. In the event of our retirement from France, the Strategic Striking Force in Norfolk would be our sole offensive arm, and would be in the best position to carry out its work. It is also well placed to co-operate with the Navy should occasion arise.

*Strategic Air Routes.* It is intended that, in case of urgent need, Strategic Striking Forces shall be available to co-operate with the Army, and, when possible, also with the Navy. The Strategic Forces of the Allies should be mobile in order that they may concentrate for attack on any objective. With this end in view, it is proposed to arrange for a chain of aerodromes, well behind the lines, which will form strategic air routes.

## V
## EMPLOYMENT OF AIR FORCE FOR HOME DEFENCE

The defensive measures hitherto devised against hostile aircraft attack consist of the following:

(i) Defence squadrons.

(ii) Anti-aircraft guns, assisted by searchlights.

(iii) Balloon barrages.

(iv) Reduction of lighting.

(v) Protective works and camouflage.

The first three forms of defence are valuable, but absorb very large numbers of men and quantities of material. The personnel alone, employed in London defence, is equivalent to approximately two divisions – this includes the personnel of the 11 squadrons detached for the defence of the Capital. When it is remembered that the large amount of material and personnel is immobilised owing to the possibility of an occasional raid, it will be seen that the balance of advantage is on the enemy's side.

Defensive measures on this scale for all the principal cities and industrial centres in the United Kingdom could only be created at the expense of the armies in the field and of the Strategic Striking Force. It is therefore obvious that we should not develop a defensive system on these lines. The alternative – and this affords an additional reason for building up the Strategic Striking Force – is to destroy the enemy's aircraft bases and to attack his aircraft factories and supply and repair depôts. The Allies are beginning to lead in aircraft production, both as regards quality and quantity. If the special measures, already indicated in this paper are taken,

the greatly superior industrial resources of the Allies, and particularly of America, will ensure so large a preponderance in the striking arm, as to leave Germany with very little margin for air raids. If the British and American programmes in view can be realised, and to ensure this unanimous support is required, the combined American and British striking force will be able in June 1919 to deliver hundreds of tons of high explosive at a blow. With such a force, it should be possible to keep down the German air offensive, by occasionally diverting forces for that purpose.

Though Germany has been proved in many ways to have an advantage by being on interior lines, yet from the point of view of air raids we hold a marked advantage in the wide dispersion of our Munition Industries. They have sprung up since the outbreak of war, and are distributed throughout the Kingdom. As a whole they are far less vulnerable than those of Germany, which, as already shown, are centred on three densely packed area, two of which are within easy striking distance of a force operating from the Ochey district.

There is one other consideration in the anti-aircraft defence of Great Britain which is now engaging our attention. Under the present organisation aircraft attached to the navy are responsible for defensive measures over sea, while Home Defence Squadrons are responsible for defensive measures inland. There is in this a great tendency to work in watertight compartments. Full advantage has not been taken of the great mobility of aircraft, and in many cases there is still insufficient co-ordination. With centralised control, which must be complete to be effective, it will be possible by a certain measure of re-organisation, and by the substitution of the better types of machines which are now becoming available, to connect up our defence and thus obtain fuller value for the expenditure of the Air Force employed.

## VI
## METHODS NECESSARY TO DEVELOP AIR POWER

Economy both of our present establishment and of our future resources, in order that all surplus to actual naval and military requirements may be utilised to build up the Striking Force, is the first measure in view. To carry this into effect it is imperative that the allocation of all available aircraft resources shall in the first place rest with the Air Ministry, and that it shall supervise generally the use to which allocations are put. The necessity for this is the justification for the step taken by the Government in creating a separate air service and Ministry to allocate the resources and view the air problem as a whole.

It cannot be objected that this policy implies interference in naval and military spheres. We wish rather to be in the position of expert advisers to the Admiralty and War Office. The necessity for this lies in the fact that both the value and use of aircraft in war constitute a constantly varying factor. The Navy is in a position to estimate the battle value of any type or combination of warships, and the Army can build up its calculations on the known values of its various components, batteries, brigades, divisions, army corps, &c. In both services, experience

has provided a more or less exact basis for calculation. But this is not the case with regard to air force. Here calculations must be built upon an unstable basis, upon a complicated organisation which is essentially technical in nature and in a state of flux. Let us take, for instance, the aeroplane unit, which is a squadron. There is no common multiple to which the value of squadrons may be reduced. For technical reasons, squadrons may consist of varying numbers of machines. A squadron of "V" type Handley-Pages consists of six machines; a squadron of twin-engined Handley-Pages, of 10 machines; a squadron of, say, DH9s, of 24 machines. In bomb-carrying capacity a single "V" type Handley-Page aeroplane is the equivalent of about 10 DH9s, while the range of the Handley-Page is three times as great as that of a DH9. This is the general comparison to-day, but tomorrow a technical alteration, eg, the installation of another type of engine may at once alter the battle value of a type. I have chosen as an example a general comparison between two types of bombers. But consider the various types which have now been ordered, and it will be seen how difficult the problem is. There are day bombers and night bombers, fighter reconnaissance machines, artillery machines, scouts, &c. In each category there is a large number of types and each type is constantly changing in battle value. The same applies to other types of aircraft – seaplanes, flying boats, and dirigibles. Development is so rapid that it is difficult now for experts to keep up-to-date in appreciating the actual value in the field of each of the ever-changing types. It is submitted that it is not possible for the Navy or Army to do so. The procedure which we wish to establish is that the naval and military authorities shall tell us what work is required and that we shall allocate the amount of air force necessary to carry out the work. Only on these lines is it possible for the Air Ministry to ensure the maximum economy in the use of aircraft resources which it controls. Otherwise wastage must occur, and wastage entails delay in building up the decisive arm – the Striking Force.

Our experience has established within comparatively close limits, the numbers of aircraft that are necessary for the service of the Navy, and of the Armies in the Field. With this knowledge, combined with a knowledge of the tendencies of development and the rate of production, it should be possible to prepare a combined programme to cover requirements in all categories and from thence to consider the development of an Aerial Offensive Force whose size and power need only be limited by the extent of the Empire's resources.

As so rightly stated in the paper circulated by Sir Robert Borden – the Royal Air Force is an Imperial Service. The energetic co-operation of the Empire in this effort is an imperative necessity if success is to be achieved. Canada already supplies a very substantial proportion of our fighting pilots. This splendid effort must be maintained, and if possible, increased. Australia has four squadrons in the Field. South Africa has her representatives in almost every air formation which crosses the lines. India has not yet been developed, though a beginning, a very small beginning, has been made. We have already taken up this matter with the Indian Government with a view to rapidly expanding the existing organisation in order that we may draw upon India's vast resources of personnel and material. In this connection, it should be noted that the personnel of a squadron is drawn from different trades, among which are

carpenters, sailmakers, blacksmiths, coppersmiths and acetylene welders. Many thousands of excellent workmen are ready in India to fill these requirements. It would be strange also if a people which has produced some of the finest horsemen, polo players, cricketers and sportsmen in the world could not supply a large quota of pilots and observers. If properly organised and developed, India could undoubtedly relieve some of the squadrons which are employed in the Middle East.

We have in India a potential reserve which could with assistance develop air force to cope with the possible menace to its frontier, and with the danger in Persia which the CIGS referred to in his statement. On the other hand, while touching on this subject, I should like to indicate that any large German development in the East would be chiefly dependent upon her home munition supply, and should not be possible if the programme advocated in this paper is approved and carried into effect.

There are at present in the East, including existing Training Units and those in course of formation no less than 31 squadrons, which is nearly half the strength of our total air force in France. Egypt is training on an average 120 pilots a month, but nearly 30 per cent of this output is absorbed in the various theatres administered by the Headquarters, Middle East, in Cairo. Our attention is so concentrated on the struggle across the narrow seas, that few know or realise how extensive are our Air Commitments elsewhere. Our air frontiers in the Middle East are vast. Apart from the squadrons in India, the aeroplanes of the Middle East Brigade alone have flown over the mountains of Macedonia, the plains of Mesopotamia, the forest clad highlands and bush-covered swamps of East Africa, and the deserts of Arabia, Sinai and Makar. Our northern air frontier in the Middle East ranges from Macedonia to the Persian border, our southern air frontier from Darfur to Dar-es-Salaam. It is India's great task to take up some of this responsibility, and to develop the air defences of her own frontiers, in order that the policy may be pursued which has already been adopted by the War Office – the concentration of all available strength in the decisive theatre. We intend to start an aeroplane factory in India as soon as possible in order that she may become self-supporting as regards aeroplane supply. Engines are the great difficulty, and in this we hope America will help us out. An aeroplane factory has already been started in Egypt, and is about to begin work in a small way. Energetic steps have been taken to expand and speed up this source of supply, and also to draw upon Egyptian man-power to develop the important training centre in that country. The Egyptian climate, particularly during the winter, when weather conditions place us at a disadvantage at home, is a valuable asset of which full advantage is beginning to be taken. In concluding this review of the East and Middle East, I would mention that steps have been taken to start building seaplanes and flying boats in Malta.

From the above review, it will be seen that our aim is to render the East and Middle East, as far as possible, self-supporting, in order that we may utilise all the remaining available air resources of the Empire nearer home.

If properly organised and developed, there is no doubt whatever that the Air Forces of the Empire will remain the dominant factor in aerial warfare during 1919. We must also aim at a co-ordination of effort of all the Allies and help America in every possible way to develop her air power. Our resources, as well as those of our European Allies, are to a large extent limited by the size of the armies already in the field, and by the amount of man-power and warlike material necessary to maintain them. America on the other hand is still largely unfettered regarding her policy for the future, she has already enrolled large numbers of men, but the inevitable commitments of replacing wastage are not yet within measurable distance of hampering her expansion in other directions. Potentially, America may represent 50 per cent of the Allied Air Force in 1919. It must be our aim to help to bring this force into being so that the Allies will be in a position to deliver by June 1919 a really smashing aerial offensive against the German vitals.

# APPENDIX A

## EMPLOYMENT OF AIR FORCE ATTACHED TO ARMIES

The work of aircraft attached to armies may be summarised as follows:

(a) Reconnaissance and Aerial Photography.

(b) Observation of Artillery Fire.

(c) Contact Patrol Work.

(d) Aerial Fighting.

(e) Bomb Attacks.

(f) Low Flying Attacks on Ground Objectives.

To deal with these in the above order:

(a) Reconnaissance may be either local, ie, of trench systems and gun positions, or distant, ie of back areas, including depôts and lines of communication to a distance of approximately 100 miles behind the enemy's lines. Aerial photography plays a very important part in both types of reconnaissance. Photographic maps have been made of the entire trench systems of the enemy. These are kept up to date by constant photography from the air, and by this means any alteration or development in the enemy's defences is traced. Similarly, hostile gun positions are kept under constant photographic survey. Suspected gun positions reported by aerial reconnaissance are photographed and carefully analysed under the microscope. Aerial photography also plays an important part in more distant reconnaissance. The principle upon which these are carried out consists in visiting the more important concentration centres which contain road and railway junctions. By comparing the reports received, it is possible for the General Staff to draw conclusions as to the trend of enemy movements. Aerial photographs of such centres are considered with the reconnaissance reports, and are extremely valuable in judging as to the reliability of the latter and in supplying additional information.
A proportion of the photographic work, particularly in the nearer zones, is carried out by fast single-seater machines flying at a great height, but information has often to be fought for, and formation flights of six or more machines are also used. The machines employed are of the fighter reconnaissance type, and much offensive and defensive work is entailed.

(b) *Observation of Artillery Fire.* This is carried out by two-seater machines, and the normal method of directing fire is by wireless. The work has grown increasingly complex

and highly trained personnel is essential. Both the Pilot and Observer are trained to direct the fire of the batteries, but the work is usually carried out by the Pilot, while the Observer looks out for hostile aircraft.

(c) *Contact Patrol Work.* This work consists of keeping touch between the principal components of an army and between these components and the various Commanders concerned. It is generally carried out by two-seater machines which fly at heights varying from 2,000 to 500 feet. The work is difficult and requires careful training both of Pilots and Observers. The operations referred to in the above three categories are carried out by what are termed "Corps Squadrons".

(d) *Aerial Fighting.* Although all machines are armed and fight when occasion arises, the bulk of the offensive work in the "zones of the armies" is carried out by special squadrons formed for that purpose. These squadrons consist of fast single-seater machines which operate in flights of six or more. The functions of these squadrons are:

(1) To drive off the enemy's fighting machines and thus enable to corps squadrons to carry out their work.

(2) To prevent the enemy's "corps" machines operating, and to carry out a vigorous offensive against the enemy's machines of all descriptions wherever encountered.

The bulk of the work of these fighting squadrons is carried out over or a few miles beyond the enemy's lines. These squadrons are numerous and form a large proportion of the strength of the air force in the field; the proportion is two single-seater fighter squadrons to one corps squadron.

(e) *Bomb Attacks.* Systematic bombing both by day and by night has developed very extensively during the past year. By day the work is usually carried out by formations of both single-seater and two-seater machines, flying at from 10,000 to 20,000 feet. In the battle area it is necessary for the formations to be escorted by fast single-seater fighters. For more distant work, the formations are escorted over the "Line" and met and escorted on the return journey. A very considerable amount of bombing is also carried out by night, this work is performed by special short-distance night-flying squadrons, and an escort is necessary. The objectives by day are troops, convoys, dumps, and other targets of tactical importance. By night the principal objectives are enemy aerodromes, railway stations, trains, billets, &c. These are frequently attacked from a low height.

(f) *Low Flying Attacks on Ground Objectives.* These are carried out by single-seater machines such as "Camels". Light bombs are used in conjunction with machine gun fire, and the machines attack their objectives, which are generally troops or transport, from

heights as low as twenty feet. Low flying attacks of this nature are also made on enemy aerodromes, with a view to dislocating his arrangements for aircraft co-operation.

Transcribed by RAF CAPS from a copy held at RAF Air Historical Branch.

An electronic version of this document is available at:

http://www.airpowerstudies.co.uk/apps/documents/

Air Ministry,
Hotel Cecil, Strand, W.C. 2.,
18th July, 1919.

His Majesty the KING has been graciously pleased to approve of the award of the Victoria Cross to the late Captain (acting Major) Edward Mannock, D.S.O., M.C., 85th Squadron Royal Air Force, in recognition of bravery of the first order in Aerial Combat:-

On the 17th June 1918, he attacked a Halberstadt machine near Armentieres and destroyed it from a height of 8,000 feet.

On the 7th July, 1918, near Doulieu, he attacked and destroyed one Fokker (red-bodied) machine, which went vertically into the ground from a height of 1,500 feet. Shortly afterwards he ascended 1,100 feet and attacked another Fokker biplane, firing 60 rounds into it, which produced an immediate spin, resulting, it is believed, in a crash.

On the 14th July, 1918, near Merville, he attacked and crashed a Fokker from 7,000 feet, and brought a two-seater down damaged.

On the 19th July, 1918, near Merville, he fired 80 rounds into an Albatross two-seater which went to the ground in flames.

On the 20th July, 1918, East of La Bassee, he attacked and crashed an enemy two-seater from a height of 10,000 feet.
About an hour afterwards he attacked at 8,000 feet a Fokker biplane near Steenwercke and drove it down out of control, emitting smoke,

On the 22nd July, 1918, near Armentieres, he destroyed an enemy triplane from a height of 10,000 feet.

Major Mannock was awarded the undermentioned distinctions for his previous combats in the air in France and Flanders:-

Military Cross. Gazetted 17th September, 1917.
Bar to Military Cross. Gazetted 18th October, 1917.
Distinguished Service Order. Gazetted 16th September, 1918.
Bar to Distinguished Service Order (1st). Gazetted 16th September 1918.
Bar to Distinguished Service Order (2nd). Gazetted 3rd August, 1918.

This highly distinguished officer, during the whole of his career in the Royal Air Force, was an outstanding example of fearless courage, remarkable skill, devotion to duty and self-sacrifice, which has never been surpassed.

The total number of machines definitely accounted for by Major Mannock up to the date of his death in France (26th July, 1918) is fifty.
- The total specified in the Gazette of 3rd August, 1918 was incorrectly given as 48, instead of 41.

Extract from the London Gazette for Major Mannock VC, 18 July 1919 (Transcript from Gazette (18/7/19))

## Major Mannock, No. 85 Sqn[1]

"The Squadron moved down to ST. OMER and the writer frequently met Major MANNOCK, who eventually took over command of the Squadron and thus had some opportunity of gauging his methods and work. Perhaps there was no greater loss both from a war and a peace time point of view, for MANNOCK was exceptional in that he was above all a leader and many as were the aircraft he himself shot down, he secured to others success which they would never have attained except through the agency of his leadership. There was often great difficulty in bringing enemy single-seaters to battle. Direct methods led to their retirement; their approach to the line was timed when patrols had gone home, or were in another part of the sector. To ensure contact called for foresight and thought. Often MANNOCK would work for half an hour or more, his patrol blindly following, to get east of an enemy formation and so force battle: never, except to rescue some overwhelmed formation, would he attack without the greater advantages in his favour. Rapid, yet thorough appreciation of the situation preceded every move. Of a nervous and imaginative temperament, he grasped the situation, summed up every factor, laid his plan of action and allowed nothing to interfere with it. Secure in the loyalty of his followers, who had implicit faith in his leadership and who knew that both success and safety lay in keeping close to him, he raised air fighting and team work to a higher level than ever before and deserves to be recognised as the greatest leader the Flying Service produced. Diffident of his own merits, never exaggerating his own achievements nor making claims of a doubtful nature, his record is in danger of being lost and his example obscured by that of the more striking individualist. Those who were privileged to meet and work with him will, however, never forget what is owing to him.

Eventually he was brought down in a manner which his own prudence had warned others against; by ground fire, due to following a 2-seater which he had already shot down in flames.

The full version of this essay is available at:

http://www.airpowerstudies.co.uk/apps/documents/

[1] Extract from an essay entitled 'Service Experiences' by Squadron Leader G.B.A. Baker, M.C. as published in 'Air Publication 1308: A Selection of Lectures and Essays from the Work of Officers Attending the Fifth Course at the Royal Air Force Staff College 1926-27'. First published by the Air Ministry, April 1928.

# Synopsis of British Air Effort during the War 1914 – 1918

At the outbreak of war, the British Air Service consisted of a Naval Wing, administered by the Admiralty, known as the Royal Naval Air Service, a Military Wing, under the control of the War Office, known as the Royal Flying Corps, and a Central Flying School. The strength of the Naval Wing in August, 1914, was 91 aeroplanes and seaplanes, (of which only about half were fit for war service), 7 airships and 130 officers, and 700 other ranks. The Military Wing, comprising 4 aeroplane squadrons and an Aircraft Park, had a strength of 179 aeroplanes, 146 officers and 1,097 other ranks. In August, 1914, the mobilised strength of the British Air Service consisted of 276 officers and 1,797 other ranks. The total aircraft fit for active operations and regarded as first line strength, was approximately 110. The French were slightly better off with 120 aeroplanes ready for service in the field; the Germans entered the war possessing nearly double that number, namely 232 aeroplanes.

When the war ended, the Royal Air Force was incomparably the strongest air force in the world. It included 30,000 officers, 261,175 men, 22,647 aircraft of all kinds and 103 airships (a first line strength of 3,300 aircraft). There were 274 aerodromes overseas and 401 in Britain; there were 188 service squadrons (99 on the western front, 14 in the Middle East, 4 in Italy, 16 in the Mediterranean and 55 at home) and about 200 training squadrons.

(By comparison the German strength in aircraft at the armistice was approximately 20,000 while, in August, 1918, the French strength in serviceable aircraft stood at 15,342. The first line strength of the two countries was 2,390 and 4,511 respectively, at the termination of hostilities.).

Ranged behind the service was a great aircraft industry employing 347,000 persons – more than 3 times the number similarly employed in Germany and as compared with 186,000 in France. The productive capacity of the British industry was some 100 completed aeroplanes a day in October, 1918. All told throughout the war, Great Britain manufactured 55,093 airframes and 41,034 engines. Of her Allies, France built 67,982 airframes and 85,317 engines; Italy is said to have manufactured 20,000 airframes and 38,000 engines, while America, in the course of her 21 months' participation in the war, produced for her own use 15,000 airframes and 41,000 engines. Germany up to January 1919 had built 47,637 airframes and 40,449 engines.

## Co-operation with the Army

The four Royal Flying Corps squadrons which crossed to France for service with the Expeditionary Force between the 12th and 15th August, 1914, had a strength of 105 officers, 775 other ranks, 63 aeroplanes, and 95 M/T vehicles. The first British air reconnaissance was made on the 19th August. During the first year of the war, the British air strength increased with the expansion of the Expeditionary Force and by the date of the Battle of Loos, September, 1915, there were in France twelve squadrons comprising 161 aeroplanes and four kite balloons.

Meanwhile, hostilities in other theatres of war had created fresh demands on aircraft resources. In the Dardanelles in 1915, aeroplanes, seaplanes and kite balloons of the Royal Naval Air Service worked with the Navy and Army before and during the operations on the Peninsula, while a small seaplane unit also gave vital assistance in the destruction of the German cruiser "Konigsberg" in the Rufigi Delta. The operations against the Turks in Sinai called for air co-operation from the Royal Flying Corps in Egypt. From a small beginning, an extensive air organisation was built up, not only for active operations, but also for training purposes, and from the middle of 1916 onwards, Egypt became the centre of air organization in the Middle East. The campaign against the Turk in Mesopotamia also absorbed both Naval and Military strength before the end of 1915. During the early months of 1916 the campaigns in German East Africa and Macedonia made further calls on the Royal Flying Corps.

By the 1st of July, 1916, the opening day of the Battle of the Somme, the strength of the Royal Flying Corps in France had grown to 27 squadrons, representing 421 aeroplanes and 14 balloons. In the other theatres of war, one squadron (South African) and a naval unit were working in German East Africa, one squadron was at Salonika, two squadrons of the Royal Flying Corps, and one naval seaplane unit (with three seaplane carriers) were working from Egypt or off the coast of Palestine.

After three years of war the strength of the Royal Flying Corps on the 4th August, 1917, was as follows:-

| **Theatre of War** | **Squadrons** | | | |
|---|---|---|---|---|
| | Service | Training | Aeroplanes | Pilots |
| Home | 31 | 69 | 1937 | 1945 |
| France | 52 | - | 846 | 1064 |
| Egypt & Palestine | 4 | 5 | 267 | 109 |
| Salonika | 2 | - | 98 | 54 |
| Mesopotamia | 2 | - | 42 | 21 |
| East Africa | 1 | - | 15 | 21 |
| India | 1 | - | 45 | 30 |
| Canada | - | 15 | 257 | 53 |
| | 93 | 89 | 3507 | 3297 |

In the last year of War the Squadrons of the Royal Air Force not only co-operated in the series of defensive and offensive actions by the British forces but they also took a direct part in some of the battles in which the French and Americans were engaged.

There were daily reconnaissances, close and distant, to report upon the enemy's dispositions, almost a routine of flights in co-operation with the fire of the artillery, photography of the

German defensive areas, contact patrols flying low down over the infantry, keeping a watch over their movements in battle, sweeps in the air which led to many conflicts, bitterly waged, with German fighting formations, and, above all, a relentless bombing and machine-gun offensive which had a cumulative effect upon the German morale.

By the end of the War the original four squadrons of the Royal Flying Corps had multiplied twenty-five times to a total of 99 Squadrons and 6 Flights. In the course of the last 30 months the service accounted for more than 7,000 enemy aircraft, dropped some 7,000 tons of bombs, flew over 900,000 hours, fired over 10½ million rounds at ground targets, brought down nearly 300 kite balloons and took over half a million photographs in the Western theatre alone.

## Co-operation with the Navy

Air co-operation with the Navy was necessarily more complicated and presented a different problem from that which faced the Royal Flying Corps. An enormous amount of energy and experimental work was necessary before the natural difficulties, attendant upon operating aircraft over large stretches of the sea, could be overcome. It was in fact, not until 1917 that the patient and often disheartening work of research and experiment of the two previous years was brought towards fruition. Meanwhile on the opening of hostilities, the duties of naval aircraft were mainly confined to coastal and cross-Channel patrols from stations which had been established along the East coast. On the 1st September, 1914, the Admiralty assumed responsibility for the air defence of Great Britain and, as part of their policy, opened an air offensive against the German Zeppelin bases. As a result, during the first year of the war, 4 Zeppelins were destroyed and one seriously damaged by naval pilots. Throughout the remainder of the war, 5 further Zeppelins were shot down by pilots of the Royal Flying Corps and 9 others destroyed by naval aircraft.

It was, however, largely the menace of the unrestricted German submarine campaign which commenced in February, 1917, that exerted a dominating influence on naval air policy throughout the remainder of the war. The critical situation in regard to Allied shipping in April, 1917, did much to accelerate the growth of naval aircraft, from that time onwards. The development of the large flying boat met at first with considerable success against the submarine and, during the summer of 1917, five "U" boats were destroyed by bombing from this type of aircraft unaided by surface vessels. Two further submarines were sunk during the year through the agency of aircraft. One was sighted by a kite balloon and destroyed by depth charges; the other by bombs from a float seaplane. Small airships for convoy escort and kite balloons for towing from surface craft were also developed. For use of the Grand Fleet special aircraft carriers were constructed and fighting and reconnaissance aeroplanes were carried in cruisers and capital ships. By the end of the war, no less than 100 aeroplanes were allocated to fighting ships of the Grand Fleet. In the Mediterranean as well as over the North Sea naval aircraft waged an unceasing war against hostile submarines and maintained a bombing offensive against the Turkish communications in Asia Minor and the Red Sea.

## Independent Air Force Bombing

Up to the spring of 1917 the expansion of the air services had been more or less gradual and their work in the war was regarded as purely ancillary to the naval and military forces. From that time onwards, however, the growth of the air weapon was intensified not only in the British air services but also in France and Germany. Aircraft came to be regarded more and more as a strategic striking arm independent of land and sea forces. This outlook led in due course to the formation of a separate service – Royal Air Force – and the establishment of in the middle of 1918, of an independent bombing formation, known as an Independent Air Force, for attacks on industrial areas in Germany. During the 6 months of 1918 when this force was operating, no less than 543 tons of bombs were dropped by day and night over the Rhineland area. Apart from the damage inflicted, the attacks had a depressing influence on the morale of the workers and of the population generally. The effect on the output of war material was important, as was also the immobilising of fighter aircraft for defence and the allocation of a large number of ground troops to anti-aircraft batteries, search lights and balloon barrages.

## Eastern Theatres of War

While the bulk of the air strength was concentrated in the main theatre – the Western Front – British aircraft were also taking part in the operations in Egypt, Palestine, Mesopotamia, Persia, East Africa, Arabia, Macedonia, Italy, Mediterranean and India.

In Palestine in 1918, the Royal Air Force achieved a mastery in the air which was virtually complete. By September, when Allenby made his great offensive, air reconnaissance by the enemy had almost ceased. The chief Turkish telephone exchanges were destroyed by bombing and the dislocation in the communications which followed rendered the German and Turkish commands almost impotent in the battle. Perhaps more important was the bombing of Turkish retreating armies in the defiles, notably the Wadi-el-Fara, where as the result of air action the road became blocked with a mass of panic stricken men and animals and the Turkish 7th Army ceased to exist as a fighting force.

On the Macedonian front there was similar, though less devastating, bombing of the retreating Bulgars in the Kryesna and Kosturino passes.

In Italy, where in November, 1917, four Royal Flying Corps squadrons had been sent to co-operate with the British forces, after an Italian defeat at Caporetto, the Royal Air Force helped, in June, 1918, the Italians' air service to stem the Austrian advance, notably by an effective bombing of the Plave bridges. They helped again, mainly by bombing and machine gun attacks, in the final offensive which broke the Austrian resistance.

## Production

The various extensions in the use of aircraft, including its development as an independent weapon, led to a demand for a greatly increased rate of production. This was only brought about by an expansion of the industry and a re-organisation of industrial man-power generally.

On the outbreak of war, the bulk of the aircraft was supplied by eight private firms and the remainder were produced by the Royal Aircraft Factory. The Aero engine industry in Great Britain was practically non-existent. By August, 1916, 491 firms were engaged on the production of aircraft, engines and accessories, representing a total labour strength of 60,073. During that year (1916) 6,150 aeroplanes and seaplanes and 5,364 engines, were produced in this country. By November, 1917, the aircraft and engine industry had grown to 771 firms employing 174,000 men, women and boys. During that year the production was absorbing labour to the extent of 347,112 hands employed in 1,529 firms. The production for 1918 rose to 32,000 aeroplanes and seaplanes and 22,088 engines.

## Assistance to America

During 1918 Great Britain, in addition to providing for her own requirements in aircraft, had also to give considerable assistance to the American forces in Europe, both for training air personnel and in aircraft equipment. In all, some 700 American pilots passed though British schools and graduated at our aerodromes. Ten American squadrons were also partially trained in Canada. Ground personnel to a maximum of 15,000, coming from America untrained, were also attached to training units in England for three to eight months. Large numbers of aeroplanes were also supplied and, when the question of producing the Liberty engine was considered, every facility was given and all our experience placed at the disposal of the American Government. Some 95 officers were sent to the United States to assist in an advisory capacity.

## The Air Effort of the Dominions

The assistance given – especially in personnel – by the Dominions to the air forces of the Empire during the war was considerable. In 1915 the Dominion Governments, fore-seeing the inevitable development of air co-operation in land and sea warfare, made offers to organise their own flying formations and encouraged their young men to volunteer and take up flying. The Australian Flying Corps, which was established in 1915, provided four squadrons for service in the field. The first arrived in Egypt in April, 1916, and played an important part in the Palestine operations. The remaining three Australian squadrons served in France, where the first arrived in August, 1917. The strength of the Australian Flying Corps in November, 1918, amounted to over 250 pilots and over 3,000 other ranks.

Over 8,000 Canadians served as officers in the air services and, at the Armistice, there were nearly 2,500 in the Royal Air Force, while 1,200 Canadian cadets were undergoing training in England and Canada. Some 300 New Zealanders also served as officers in the air services.

South Africans also formed the greater part of the personnel of No.26 Squadron which provided the aircraft during the operations in German South-West and German East Africa. In all, some 3,000 South Africans were commissioned in the flying services.

## Air Force Casualties

The casualties suffered by the Air Force during the war amounted to 16,623. Of this total, 6,166 (4,579 officers) were killed, 7,245 (5,369 officers) were wounded and 3,212 (2,839 officers) were missing. By comparison, the total German air casualties were 15,906 (6,890 officers).

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# EXPERIENCES IN THE WAR, 1914-1918
# AN ESSAY

*by*
*Squadron Leader K R Park, MC, DFC*

## PART I – WAR EXPERIENCE WITH THE FIELD ARTILLERY

Though during two years' active service with the artillery I carried out no close co-operation with the RFC, I had opportunity of observing its work on three fronts. As I hoped, and on several occasions endeavoured, unsuccessfully, to transfer to the RFC, I took a keen interest in its activities; as far as was possible from the ground. I shall therefore devote the early part of this essay to the point of view of the ground observer.

### 1. Egypt, 1915.

During the Turkish attack on the Suez Canal in February 1915 several British aeroplanes were daily seen flying above the lines. Though we all took keen interest in the aeroplanes, it did not occur to any of us that they were in any way connected or concerned with the operations. Complete ignorance existed, except perhaps at GHQ, as to the duties and capabilities of the aeroplanes.

I have since learnt that those "mysterious" aeroplanes accurately located, and reported the enemy columns several days before the attack.

During the two months training for the Gallipoli campaign we remained in the same complete ignorance as to aircraft and their duties.

### 2. Dardanelles.

Neither during nor after the landings on 25 April was it known by units that the RNAS had previously photographed all the landing places and fixed field defences on Gallipoli. For some weeks after the landing every aeroplane seen flying over land or sea was believed to be piloted by Commander Samson. The few aeroplanes occasionally seen were not believed to have anything to do with the land operations. It was not until well on in the campaign, when a Taube dropped darts and some small bombs, that the troops realised that the aeroplanes were taking an interest in the fighting. From this time on, everyone with a rifle opened fire on any aeroplane seen approaching from enemy side.

Aeroplane markings were not known to exist until late in the campaign.

(a) **The Landings.** It is not known what information the aeroplanes supplied to GHQ before the landings, but the covering forces would have welcomed air photos or details of

enemy defences on various beaches. Such information was not given each covering force. Bad maps made air photos essential to Artillery as well as the Infantry.

The Naval supporting fire during the first three days would have been immeasurably more effective if directed by aircraft flying over the shore.

(b) **After the Landings.** The ships' guns failed effectively to interfere with enemy reinforcements, ammunition, and supply columns. With efficient aerial observation, Turk communications could have been seriously interfered with by ships' guns.

Owing to Turks holding the commanding high ground everywhere on shore, batteries needed aerial observation.

(c) **Naval Supporting Gunfire.** Some months after the original landing, RN Forward Observing Officers established OP's ashore to direct ships' guns against enemy batteries, columns and defences. These officers obtained poor results under shore conditions of fire observation. I believe that proper aerial observation would have secured far better results than numerous FOO's.

From my battery's OP's (on flanks) we quite frequently watched ships "plastering" open tracts of country in vain endeavour to silence Turk batteries. The "Olive Grove" and "Chocolate Hills" batteries, which were out of range of our land artillery, enfiladed the beaches at Anzac, causing heavy casualties for many months. Both these batteries were engaged, not a dozen but scores of times by ships of varying sizes and of varying armament. Nearly five months after the original landing, when I transferred from Anzac to Cape Helles, both the above batteries were still in action.

I could quote numerous instances of ineffective bombardments of shore targets by both large and small ships during the whole campaign. On no occasion did I see an aeroplane flying over or near a target which was being engaged by ship's guns.

(d) **"AA Defences"** were not attempted until four or five months after the original landing. At about that time experiments were tried out, using standard 18pounder Field Guns, but these were not a success. That even at the evacuation in January 1916 we had no organised "AA" Defences proves how little importance was attached to aircraft by our higher command.

(e) **Army Co-operation.** During the whole campaign there was no attempt at co-operation of aircraft with Infantry. The Suvla Bay operations were admirably suited for co-operation of this kind. Even seaplanes flying up and down the shore line could have kept the Corps Commander (on board ship) in touch with the situation ashore.

> I do not suggest that the miserable failure of the Suvla Bay Corps would have been prevented; but given proper aerial co-operation the failure would have been lessened in degree.
>
> The inadequate naval force supporting this particular operation did not use any aircraft for observation of its fire. The Artillery support, or lack of it, was the main cause of failure.

**Counter Battery work,** in its most elementary form, was commenced in August at the Helles end of the Peninsula. Both Corps HQ and the heavy artillery were sceptical as to the value of this form of shooting. I do not know what measure of success was attained by the close of the campaign; hostile guns were engaged, but I did not hear of any enemy batteries being put out of action. On my divisional front the hostile batteries increased both in number and activity during the last phase of the operations.

Until attempts at CB work were commenced it was not generally known that there were any aeroplanes working for the Army.

Vague reports of seaplanes attacking Turk ships in the Sea of Marmora were heard, but no one knew what duties the Flying Units were engaged on.

The most frequent complaint of the heavy artillery was that "No sooner had the battery commenced ranging than away home flew the aeroplane". It was usually said: "Oh, there they go home for afternoon tea again". Remarks of this kind were passed on, and coupled with everyone's ignorance of the work being done by the Flying Wing, helped to discredit their good work in the campaign.

Officers who talked of transferring were openly ridiculed for wanting to join "A Ragtime Show". So strong and lasting were these early prejudices that in my own division, as late as the autumn of 1916, an officer who suggested applying for transfer was laughed at, and asked: "Was he tired of the war". This attitude was not confined to battery messes, and to those of us who had friends in the RFC, and who knew what good work was being done, it was uncommonly annoying. Even after the issue, in 1916, of an Army Order stating that all applications for transfer were to be forwarded, an experienced subaltern of my Division could not get a transfer, unless wounded, and invalided to England, where he was "struck off" the strength.

HQ, Med Exp Force or Corps HQ may have issued Bulletins or summaries of the work carried out by Flying Wing, but lower formation, such as Brigades, did not get these. Up to the evacuation, regimental officers remained in complete ignorance as to the valuable work, long distance reconnaissance and bombing, done by the Flying Wing.

## 3. Egypt, 1916.

After the evacuation of the Gallipoli Peninsula my Corps (VIII) was sent to Egypt for re-equipping and retraining. My own Division, 29th, was sent to Suez, where there was a Flight of the RFC.

The tactical training, which was carried on intensively for two months, did not include any work with aircraft. Further, no account was taken of the effect of aerial observation. Though it was generally known that we were training for the Western Front not the slightest account was taken of possible action of enemy aircraft. Another subaltern and I requested to be allowed to fly over the Brigade, when it was in position under cover, so as to find out how much could be seen from above. Our request was "turned down" and we were told observation from the air was all "Stuff and nonsense". This is typical of the attitude of our higher command towards everything connected with the RFC. This attitude was the basis of the ill-will entertained towards the RFC later on in France. Moreover this had a direct bearing on the work of co-operating with the RFC in 1916, and was partly the cause of the failure of early attempts.

## 4. France, 1916.

On coming into the line in April we were greatly surprised at the activity of the RFC. For the first time we actually saw aircraft at work on a battle front; to see machines flying about all day was indeed a novelty, after seeing usually two in a week in the Dardanelles.

For the first time our field batteries saw aerial photographs of enemy defences; these aroused some interest, but were not taken seriously.

When siting, digging, and covering our new gun emplacements we were informed by troops experienced on the Western Front that concealment from aerial observation was necessary. Having no previous experience of this kind of precaution on other Fronts the whole matter was considered rather a waste of labour and material. However, during the building of our gun pits some of us became convinced of the power of aerial observation. An enemy aeroplane flew high overhead when a battery close on our flank was firing. The following morning, though no enemy aeroplane was within sight, a German howitzer battery accurately shelled the position, which had to be evacuated. From that time onwards elaborate precautions were taken to camouflage gun lines, wagon lines, and OP's.

Most of our camouflage was designed for concealment against ground observation as no one in our Brigade knew what could or could not be seen from the air. In June 1916 a pilot of No 8 Squadron flew me over my Brigade's gun positions at about 3,000 feet. All positions were plainly visible on account of great quantities of newly-turned earth, new tracks, and many shadows cast by high emplacements. The batteries would have been less conspicuous if merely sited in the open. I reported the matter, but no action was taken to conceal gun positions.

Previous to the Somme Battle it was not generally known that the RFC was carrying out duties other than Artillery Co-operation. Their bombing, distant reconnaissance, and fighting activities were not heard of by formations lower than Corps HQs. The few combats seen from the ground prior to 1st July were commonly believed to be incidental. The fighting at this time must have taken place either well above the clouds or some distance behind the enemy lines, as from the ground little was seen of it. During the three months immediately before the Somme Battle I did not see or hear of any aeroplane being shot down on the Ancre sector.

**1st Somme Battle.** A Corps Squadron near Doullens (Marieux), was doing the counter battery work of our front. Presumably the concentration of heavy artillery was too great for this Squadron to cope with on so narrow a front. Some of our heavies dropped shells into our own front and support trenches. Rightly or wrongly (probably the *latter*), the Infantry and Field Artillery FOOs blamed the RFC for this misdirected shelling.

Many heavy batteries were firing from the map, in the absence of observation, during the last days of the bombardment. On the evening of 30th June I was obliged to observe for a 9.2 How Battery, and at same time carry out wire-cutting with my own battery's guns (Beaumont Hamel).

The counter battery work was bad, resulting in the failure of the attack on the Ancre in 1916. The 1st July attack on the Ancre was a complete failure; the Infantry of my own division did not even capture the enemy's first line trenches. The wire entanglements held up the advance, and afforded good targets to enemy machine gun posts and field guns, all of which had been believed destroyed by heavy gun bombardment.

The RFC was reported to have stated that the wire entanglements had been so "opened up" as to offer unrestricted passage to Infantry. Certainly an assault was made on that assumption. Owing to the complete failure of this attack there was no advance, and no contact Patrol work on this sector of the Somme Battle.

The troops who took part in this attack were very bitter, having suffered heavily without gain and heaped abuse on the Heavy Artillery, who in turn blamed the RFC. For months after this failure the Infantry were hostile towards all Artillery, and not well disposed towards the RFC. The highly coloured Press accounts of the work of the new arm, RFC, in the Somme Battle did not increase the goodwill of the troops on the Beaumont Hamel sector. The newspapers did not mention our reverses in this large offensive, naturally any failures were un-recorded by the Press.

**Ypres Sector.** Whilst the Somme offensive was in full swing my division was withdrawn, and sent North into a quiet part of the line for a rest.

The extravagant claims made by the Press as to "Our complete supremacy of the Air", "German Flying Corps driven from the air", and similar sensational statements had an unfortunate

effect on this part of the Western Front. Though RFC officers probably never made any such extravagant claims the troops on the ground got the idea that the new Corps was claiming and getting undue praise for its share in the fighting.

Just when the Press was full of these statements, the German aircraft on the Ypres Front appeared, from the ground to be having very much their own way. Enemy Balloons and aeroplanes were unusually active, the latter over and often on our side of the lines. Balloons were so close up to the front line as seriously to hamper the fire of our batteries, and all movements by daylight. Frequently, one might safely say daily, our low flying (Corps presumably) aeroplanes were dived on, and driven behind our own lines. Had people on the ground known that all available squadrons had been withdrawn for concentration South, very little harm would have been done. These facts were not known, and all that people cared about was the fact that the German aeroplanes were annoying everyone and appeared to be superior to our own aircraft, whereas the newspapers continued to declare that "The German Flying Corps was completely demoralised on the Western Front", and many similar declarations. The effect on officers, and other ranks, though lasting, was not good.

**Somme Battle** (3rd phase). On coming into the SOMME area a second time it was a pleasant change to hear the infantry praising the work of the RFC. The infantryman was loud in praise of Contact Patrol machines, and ground strafing aeroplanes, which had done good execution during the second phase of the battle. The heavy gunners actually admitted that aerial observation was now very important for counter battery work.

The RFC seemed to be really coming to the fore in October. The country round Delville Wood was strewn with wrecked British aeroplanes, which helped to dispel the popular belief that the RFC had a "cushy job".

Previous to this Army and Corps Commanders may have realised the value and extent of the RFC's work, but the fighting troops had certainly not done so. During this offensive the troops actually saw and heard the low-flying aeroplanes taking part in the fighting. Like many others, until now, I had never even seen a crashed aeroplane.

At this time a number of combats took place, mostly over our side of the lines or just on the enemy's side, and the troops took great interest, few having ever before seen an aerial combat. Whilst these combats took place high up, the German low-flying two seaters seemed seldom molested, and daily flew over our side of the lines. On many occasions these machines flew low over the lines of batteries sheltering in the long valleys behind Flers. All our gun lines were laid bare. In the valley south of Flers were three rows of guns and medium howitzers, about 100 pieces in all. Within a week from the first German two-seater flying low over that area the valley was thickly strewn with wreckage of gun carriages, limbers, ammunition wagons, and horse teams. There were no alternative gun positions, and moving guns in such a quagmire was all but impossible. Not only did the German aeroplanes discover our main gun positions,

but what roads we were using for ammunition supply. There being only two roads along which wheeled vehicles could approach (owing to shell holes) we were partially cut off from our wagon lines owing to the intense shelling, kept up on the roads, eventually having to bring up shells on pack saddles.

I feel safe in assuming that those few low-lying German machines caused more losses to the British forces than all our high flying scouts did to the enemy. Our advance was not merely held up, but stopped, owing to lack of artillery support to our infantry.

In attempting to withdraw my own section of guns from this position, I was fortunately wounded and sent home. After a short spell as instructor at the RHA Depôt, Woolwich, I managed to effect a transfer to the RFC.

## 5. General Deductions.

(a) **Egypt, Winter, 1914-15.** The Army authorities neither realised nor took advantage of the usefulness of aircraft. The fighting troops were, both during and after the operations, kept in complete ignorance as to the employment of aircraft.

(b) **Dardanelles, 1915.** Higher Command (Army) failed to take advantage of aerial reconnaissance before, during and after the landings. The available aircraft were not used to best advantage, *ie*, direct assistance of land operations, during this campaign. The Army was prejudiced against the flying units, and probably for this reason, lacked confidence in its aircraft.

The complete ignorance in which fighting troops were kept concerning the work of flying units during the whole campaign does not seem purely accidental.

The Army was dangerously short of aircraft units.

The Navy, though equipped with inefficient seaplanes, did not make the best use of its aircraft. Far too much reliance was placed on direct observation of fire from ships or FOO's ashore.

(c) **Egypt, 1916.** Higher and lower commands did not take advantage of the short training period in educating fighting troops concerning the employment of the new arm (RFC and RNAS). Concealment from the air was ignored. During three months training both gun and wagon lines were sited as if observation from the air was impossible.

(d) **France.** Much ignorance existed in the army regarding the employment of aircraft until the first battle of the Somme. This ignorance caused strong prejudice against the new arm, and retarded the education of older arms in the co-operation with aircraft.

The circulation of summaries containing figures relating to number of photos taken, number of hostile batteries located and engaged, tons of bombs dropped, does not convey much information to the Army formations. Low-flying aircraft alone impress the ground troops with the importance of and great help rendered by their air forces.

Until troops have been attacked from the air they do not practice proper concealment from aerial observation.

Successful fighting at high altitudes does not counter-balance the bad moral effect caused by a few low-flying enemy machines flying unmolested over our troops. To tell troops that (a) the ascendancy over enemy air forces has been attained; (b) the moral of enemy fighting squadrons has been lowered; (c) our scouts are driving the enemy as far back as their aerodromes, is to invite ridicule, as long as our corps machines are *seen* being driven across the lines frequently.

Air Force officers were (and still are) inclined to neglect the view point of those on the ground.

## PART II – WAR EXPERIENCES WITH RFC, 1917-18

**As Pilot.** On reporting to the Air Board prior to departing for BEF I was informed I would be posted to a Bristol Fighter squadron; that being the type I had specialised on.

I landed at Boulogne in June, along with a large batch of reinforcement pilots. A RFC officer met us, and gave posting orders to about half the party. Several officers were posted to squadrons having machines which they had not flown. This caused acute disappointment, as we had not been warned of such a contingency when in England.

Three of us who were to proceed to the Pool at IAD were handed slips stating we were pilots of day bombers, though we had all three been specialised as fighter pilots.

**Pilot's Pool.** On arriving at the Pool we were surprised to find a large number of new pilots awaiting posting; some had left England several weeks before our departure. None of these officers had been up in a machine since landing in France, and were discontented with being kept unemployed. Most of these officers had not seen any active service, and were easily demoralised by their forced inactivity on the ground. Rumours of heavy casualties were exaggerated in a stupid manner in this dispirited community.

The second day of my stay I got in touch with 48 Squadron; the only Bristol unit then in France; and before a week had passed was applied for and posted to that unit.

During my five days at IAD I learnt a lot about types of aeroplanes and engines I had not previously seen. The Depôt offered excellent facilities for new pilots to learn much about rigging and aero engines.

**Summer, 1917**. On joining, one was struck by the

(1) Smallness of aerodrome.

(2) Cheery offensive spirit of officers.

(3) Uncomplaining efforts of mechanics who worked daily 14 hours.

(4) Enthusiasm of all ranks.

(5) Good discipline (of the unconventional type).

New pilots on arrival were sent up in a machine, usually the oldest and worst in the unit, and made to show what could be done in the matter of "stunting" and landing. This test passed satisfactorily, a week or more was spent waiting to be taken on patrol. During this time no flying practice was possible owing to the shortage of machines. This resulted in a new pilot going on his first patrol after having had only one or two short flights in three, or in some cases, five weeks. This circumstance added to the following, to my mind, explains why some new pilots did not survive their first month across the lines:

(1) Lack of training in formation flying.

(2) Inexperience of flying at high altitudes.

(3) Complete lack of experience in fighting tactics.

In the winter, 1916-17, very little formation flying was taught in some training squadrons, and owing to clouds no high flying was practiced.

A new pilot's enthusiasm and keenness alone governed the extent of his knowledge of fighting and gunnery. The whole energies of Flight Commanders and experienced pilots were absorbed, or appeared to be, by their offensive patrols at this period. The spirit was: "I had to buy my experience over the lines, so why shouldn't these new hands do the same".

Though I had known two of my Flight Commanders in England before the squadron went overseas, I was never able to find out what their tactics were on patrol.

There were no thought-out tactics, as far as I know, in the different flights or in the squadron.

During my three months as pilot, before getting a flight, I was never able to find out before leaving the ground more than:

(1) Position in formation of each pilot.

(2) Area to be patrolled.

(3) Height of commencing patrol.

(4) Time of leaving ground and landing.

As to the intention of the leader: if EA were met above, below, east, on same level, in larger, even or smaller, numbers – all was left to be decided on the spur of the moment. The result was we seldom fought in any formation, but immediately became split up and fought a *"Dog Fight".* This haphazard method of fighting worked excellently as long as most members of a patrol could handle their machines and guns aggressively. The inexperienced invariably went down followed by EA, who in turn were often shot down by the experienced pilots. Unintentionally the poorer and newer pilots acted as good bait for the enemy scouts.

These tactics would have been fatal to single seater fighters; indeed, they failed miserably in the spring of 1918, when we had less skilled and less offensive pilots.

In spite of our poor tactics the squadron, between June and September, made a great success of "Hun getting".

From April to August the squadron (48) had been employed almost exclusively on offensive patrols, and prided itself on its fighting record. In August, on the Nieuport Sector, photography and long reconnaissance were commenced in addition to offensive work. Our new duties caused much heart-burning amongst the more offensive element in the squadron. The spirited pilot, who had excelled on OP did not bring back such good photographs or full reports as the duller pilot, who had perhaps never crashed a "Hun". Pilots who failed to secure good photographs on account of pursuing "Huns" were severely censured.

Photography and long reconnaissance had, by late Autumn, become as important as "Hun getting", though the squadron carried out two or three offensive patrols daily, OP's were frequently ordered to take photographs or do long reconnaissance. These additional duties greatly hampered our fighting and lowered the morale of the squadron appreciably.

**German "AA" Batteries** during the Summer of 1917, on the Belgian coast, did good execution, achieving great moral, if not material, results.

On our arrival in early July we were greatly surprised at the extreme respect shown to enemy "AA" guns on this sector.

Though the "AA" fire had been much overrated, it was admittedly more accurate than on any

other part of the Western Front. On one patrol of six BF, the leader's and one other pilot's machine was rendered unserviceable by hits by fragments. On several occasions machines were compelled to forced land through engine trouble caused by fragments of "AA" shells. Much extra work was caused by minor damage to wings, but no machine ever received a direct hit.

**German Scouts**, when we arrived on the Nieuport Sector, were numerous and over-confident. This was undoubtedly due to the defensive policy which our scouts had adopted for some time on this sector. The enemy AA batteries seemed to work in close co-operation with his aircraft in giving warning and indicating targets.

So over-confident were enemy scouts that pairs or even single scouts at first dived fearlessly onto our Bristol fighters. We believed ourselves mistaken for the Naval Day Bombers, DH4s, who had been operating on this front for some months.

Our first eight weeks were most successful as the enemy scouts were slow to learn the difference between a handy 2-seater and a clumsy day bomber. Whenever our patrols crossed the line they met with enemy formations, usually not much superior in numbers, and at first equally eager for a combat. Ideal conditions of which we took full advantage whilst they lasted.

From the eighth week onwards the enemy scouts were cautious, in larger formations, and on the defensive. We could not get to close grips unless we either sat over his aerodromes or flew purposely under his formations, enticing him to dive on our tails. There were, of course, occasional aggressively minded scout formations met with. These usually came up from the south-east, and could be relied on to attack hard and continue fighting until one or other side was routed.

The above period well illustrates the surprise effect obtained, firstly, by new methods; offensive v defensive tactics; secondly, by means of a new type of fighting machine, *ie*, Bristol Fighter.

Gotha raids on England were being carried out by daylight in July and August. As a counter to these raids it was decided to send up patrols of fighting squadrons located on the Belgian Coast. The intention being that all machines available, on warning of a raid being received from England, would "take-off", climb out to sea, and intercept the enemy raiders on their return journey.

All Officers and machines not actually on patrol were kept "Standing by" to take the air at immediate notice on days favourable for enemy raids. Not more than a dozen "warnings" were given in any one month, and the results were not up to expectations. On only two

occasions were Gothas attacked, and then by single Bristols, which did little damage to enemy formations. One Gotha was reported crashed, and another driven down in Belgium.

The weather at above time was fine, and all officers were carrying out two high Offensive Patrols a day. Though everyone was "full out" to shoot down a Gotha, the extra strain of "Standing by" was responsible for the early fatigue of a number of our best pilots and observers. Several of our most successful observers (and pilots too) who were sent on "HE" were passed as unfit for flying duties on arriving in England. It may or may not have been a coincidence that in early September most of our best and most successful fighters became so fatigued that they had to be sent home for a rest.

Whilst the fighting squadrons were being worked at high pressure, the day bombing DH4s on the Belgian Coast were having a very slack time. The pilots and observers of the day bombers averaged in summer two short distance raids every three days, and in the autumn even less flying. Their flying personnel naturally did not become fatigued and remained in Belgium.

**Escorts**. During 1917 the day bombers on Belgian Coast were provided with close escorts by Bristol Fighters on all raids. These close escorts were continued long after our fighting squadrons had attained a decided local superiority on this sector of the front.

If attacked by enemy scouts on the homeward journey the DH4s, having much superior speed, would quickly draw away from their escort. This suited us very well, as we were then left free to turn and engage the enemy formation. The only case I know of our charge (DH4s) losing machines was through their moving away from their escort, and being dived on by enemy scouts carrying out OP near the front line. As the DH4s carried double rear guns they could develop in good formation a sufficient concentration of fire to ward off most scout attacks, but they relied chiefly on their great speed for protection.

**Night Flying**. As the Gotha raids on England decreased night bombing of Dunkirk increased, and in late August my squadron was instructed to commence night flying. This with a view to sending up machines against enemy bombers, which came over every clear night at this time of the year. Only one pilot had previous experience of night flying, so training was commenced at dusk each evening. The daily routine of Offensive Patrols was not modified to allow "time off" to those pilots practicing night flying. It was represented to Wing HQ that pilots would very soon become fatigued if day and night flying were persisted in. Fortunately, before night flying had become a regular routine, higher authority decided against night operations.

The aerodrome "Bray Dunes" was a small one; bounded on the West by low sandhills having a thick belt of wire entanglements reaching the edge of aerodrome; bounded on the North and South sides by small, deep canals, and bounded on the East by an unbroken row of high trees. In daylight Bristols and Sopwith triplanes were not infrequently seen standing on their noses

in one or other of the three canals. A severe "crash" brought our night flying attempts to a sudden close.

These extra duties came at the end of an exceptionally strenuous two months' offensive, and had a bad effect on the spirit of the whole squadron.

**Autumn Activities**. From September to December the squadron's efforts were divided between Offensive Patrols, Escorts to DH4s and Corps Photo-machines, Photography, Reconnaissance and Gotha patrols. Unfortunately, all except about six of our experienced pilots had gone on HE by October. An epidemic of fatigue set in at the end of the summer and deprived us of our best officers.

**Winter, 1917-18**. With the exception of the flight-leaders and sub-leaders we were a new squadron when, in December, we moved down from the coast to the Arras Sector. Here we were kept out of the line in rest, when all we required was plenty of offensive patrols to break in our new teams (flights). For weeks we daily drilled in formation and mock combat, but no amount of this peace training could instil the proper offensive spirit as well as real fighting. I had trained my own flight during the early winter on the coast when EA were scarce and over-cautious. Much too scarce!

**St Quentin**. The period from late December to February was uneventful on this sector. The EA were on the defensive, seldom in strength and usually as far back as their aerodromes. Obviously the Germans were resting, and training for the coming offensive.

The period was most disheartening, as there was not nearly enough fighting to give the new pilots and observers training. The new people could not be sent alone or in pairs on patrol as the EA were quite aggressive when superior in numbers. Higher authority began to attach great importance to distant reconnaissance, and back-area photography. In view of this, and in the absence of enemy formations, aerial fighting began to be looked on as of secondary importance.

**Armament**. The cold was severe and was the cause of much gun trouble; the Lewis guns seldom functioning after flying at over 13,000 feet.

In three successive combats my observers' gun was out of action; the last occasion resulted in my being shot down over St Quentin – forced landing on our side of the lines. (My ammunition for Vickers had been expended).

Though we fought the Bristol as a scout, we often relied on the rear gun in breaking off a combat.

**Spring.** In February I returned to England for a rest. At the end of March I was recalled to BEF to take over command of my old squadron. During my short term of duty at home I

attended the instructors' course on Avros at Gosport, and was amazed at the progress in methods of training.

On returning to France I found my squadron had moved back to Bertangles (near Amiens), and the German advance was on the wane. The squadron was, like all others on the Somme, exerting every ounce of energy on stemming the tide of the enemy advance, which had only just been checked.

The daily routine consisted of:

(1) Continuous reconnaissance of back areas.

(2) Attack of ground targets with bomb and machine gun.

(3) Attack of enemy low-flying machines, which had been attacking our troops.

The weather was bad for flying; clouds often being only 300 to 500 feet above ground. Mist, rain and strong winds, though adverse, did not stop the work of even distant reconnaissance.

**Reconnaissance** was continuous during this critical period, and was carried out by single machines in spite of activity of EA. Army HQ was kept informed of movements in back areas throughout.

**Ground Strafing**. Officers frequently flew six hours a day, making five trips to bomb and machine-gun enemy columns. This work was expensive in machines.

**Aerial Fighting**. There were not many organised offensive patrols during the retreat period, but combats between the low-flying machines of either side were frequent. The Bristol was slow and clumsy for this low fighting, and was not more than a match for a triplane (*Fokker*).

**Spring**. The casualties during the Retreat had been moderately heavy, and we commenced the spring air offensive with a big percentage of new pilots and observers. There was not remaining one pilot who had the benefit of the previous summer's or autumn's fighting on the coast.

The Germans launched a further offensive at the juncture of British and French lines, and all squadrons in 22nd Wing were again turned on to "ground strafing".

From April onwards conditions on the ground in front of Amiens became more and more stable, and the squadron's routine was:

(1) Distant reconnaissance.

(2) Back area photography.

(3) Offensive Patrols.

(4) Escort duties.

**Summer.**

1. **Reconnaissance**. The Brigade Intelligence Officer was attached to the squadron, and was of much assistance in training observers in these duties.

2. **Photography**. From the time the line became stable, until the IV Army August offensive, the whole back area of this front had to be continually photographed. A photographic officer, and section, were attached to my squadron for this work.

3. **Offensive Patrols** were re-commenced in May, and carried out throughout the summer. Owing to the importance attached to duties 1 and 2, fighting became, unfortunately, of secondary importance.

In carrying out duties 1 and 2 combats were frequent. Reconnaissance and photos had often to be obtained in flight formation, but on these occasions the enemy scouts had the initiative, having no secondary objective.

Though our ascendancy over EA was as real as in 1917, our casualties in 1918 were much heavier. This often puzzled me, for in 1917 we had been employed to a greater extent on purely offensive patrols, and accounted for more than double the number of enemy aircraft.

For the following reasons our squadron losses in machines were much heavier in 1918 than in 1917:

(1) Lack of pilots and observers experienced in fighting.

(2) Necessity of single-machine missions.

(3) Secondary importance of fighting due to large amount of Army reconnaissance and photography.

(4) New officers not of as good material as previous year.

(5) Superior performance of enemy scouts.

**Enemy Fighting Tactics**. The Fokker Triplane employed new methods of attack in the early Summer.

Formations of these machines allowed themselves to be dived on by Bristols, then, as our machines "zoomed up" the Fokkers literally "stood on their tails", shooting from almost directly below in a blind spot. We lost two good leaders and several experienced pilots by these new German tactics. In close-in fighting (dog fights) the Triplane out-manoeuvred our Bristols, but were not a match in formation fighting, where the rear guns were of great advantage.

On one occasion when leading a squadron patrol I saw 30 Fokker triplanes and biplanes completely routed over their own aerodrome by my Bristols.

From June onwards the enemy patrolled in large formations, and on numerous evenings in July and August I saw combats take place between 40 EA and from 30 to 40 British scouts. Combats between these large numbers usually commenced at high altitude. During battle periods the enemy brought all his fighters down low for ground strafing, leaving the higher atmosphere almost clear of his machines.

Enemy fighting tactics were superior to those used by him during 1917. This was evidenced by the way his higher patrols co-operated and supported the lower formations.

Pairs or small groups of enemy scouts were not met as in the previous summer.

**Our Tactics** had been improved, and single or pairs of machines could not usefully patrol far over the enemy territory. Our machines flew in larger and more compact formations so as to develop greater volume of fire.

I found it difficult to handle a whole squadron of Bristols in formation – clumsy and inflexible. When the three flights were occasionally available for OP the two lead groups of six machines worked under the general direction of the lower and leading group. This method gave greater flexibility, but poor control; especially when one wished to make a simultaneous attack on a large enemy formation flying level and on a flank. As the Bristol has only one front gun it is necessary, in attacking end on, to bring as many guns as possible to bear on the objective, before the enemy can develop a superiority of fire.

During July and August I usually carried out a late reconnaissance or close patrol alone each evening so had excellent opportunities of studying both our own, and the enemy's tactics. The co-operation of our numerous fighting formations always struck me as being inferior to that of the enemy. Whereas his formations kept within easy support distance of one another, ours dispersed considerably, and were frequently attacked by greatly superior numbers.

I frequently saw a patrol of SEs or Camels engaged in a close fight with superior numbers of EA, when other British formations, perhaps higher and a mile or two distant, were quietly patrolling their allotted areas.

Some evenings the enemy would concentrate his formations below 13,000, and give our inferior numbers at that height more than they could cope with. Our patrols would keep at their usual high altitude, not knowing what was going on lower down, owing to the evening haze prevalent over the Somme.

There appeared to be very little co-operation between the different fighting units on this particular sector, also further north.

On leaving the ground the leaders of our formations usually knew merely that such-and-such squadrons would be out on patrol between such-and-such hours.

On several evenings in July and August two, or even three, British Scout squadrons were seen patrolling a line parallel to an equal number of enemy scouts. Our separate formations hesitated to initiate the attack, each leader presumably being uncertain whether other friendly formations would follow. Perhaps each leader thought another formation was in a better position to attack and so waited for some other squadron to attack. Meanwhile the enemy drew away east.

It may have been that each squadron was naturally confident it could look after itself on patrol, also that it did not wish to share its honours with its neighbours.

Nevertheless, I am confident that even more EA would have been accounted for if there had been co-operation between fighting units both on the ground and in the air.

Had the German pursuit flights not co-operated very closely they would have been driven beyond their aerodromes in the summer of 1918 – destroyed in detail.

By the above I do not mean that we should have adopted the "Circus" system, but co-ordinated the efforts of fighting units working on a particular sector.

**Reinforcements – Officers**

**Pilots** sent out from England were better trained in all respects than during 1917, but were not of as good a type as previously. As my squadron's work did not consist solely of fighting, I presume it was not considered that the best pilots were needed. The work was more exacting than purely fighting. New pilots required two or three weeks' training in formation and high flying, in recognition of types of machines, and aerial firing before being sent on patrol. Map reading had also to be taught very thoroughly before reconnaissance or photography work could be entrusted to a new pilot.

In 1917 it seldom happened that a pilot was sent home for further training or as unsuited for the work, but such incidents were far too frequent in 1918. I had occasion to get rid of several officers who were temperamentally unsuitable for flying.

Officers who had transferred from army units at the front were full of enthusiasm for their work, and without exception became efficient flying Officers.

**Observers**. The best observers were undoubtedly those with experience at the front with the army. Few pilots had confidence in the very young observers, coming to France for the first time, until they had several months' experience over the lines. Fortunately, in the Spring and early Summer, half our new observers were of the war experienced type.

Observers required training on joining, and for some weeks after commencing war flying, in the following:

(1) Aerial firing on ground target.

(2) Map reading and reconnaissance.

(3) Gunnery on range, and in armoury.

(4) Recognition of EA and allied machines.

(5) Photography.

For training in (4) I had a complete set of models (to scale) of enemy, and of the most common French types of machines.

The Photographic and Intelligence Officers were of great assistance in training new officers.

**Transfer to HE**. In some commands there was a recognised number of flying hours after which officers were considered due for a rest, and were sent home to England. This resulted in officers believing themselves *entitled* to transfer home on completion of so many flying hours, quite irrespective of the work done. When the average officer was within 50 or less hours of his qualifying period his thoughts were divided between HE and his work.

I was strongly opposed to the above practice, as it was a most unfair one, and introduced several obvious evils. Unfortunately, this practice prevailed until late in the summer, when officers were recommended for transfer to Home Establishment if their work showed they had *earned* a rest. Many "full out" pilots did more real work in their first two months than "luke warm" ones did in six months' of duty.

## Armament.

**Vickers** guns gave little trouble. The most common causes of trouble were:

(1) Conversion set for speeding up rate of fire.

(2) Faulty feed to gun – belt causing cross-feed.

(3) Maladjustment of sights.

**Lewis** guns gave more trouble than Vickers. The most common troubles were stoppages through:

(1) Broken extractors.

(2) Faulty magazines (worn).

(3) Faults in feed mechanism.

(4) Low temperature at high altitudes.

**CC Gear** gave a certain amount of trouble mainly through:

(1) Faulty needle valve in Reservoir Base.

(2) Air locks in pipe line.

(3) Faulty springs in trigger motor (A type).

**Enemy Night Bombing** became more frequent as the summer advanced, and every clear night his machines passed overhead on their way to the coast. When in August Bertangles received attention there were very fortunately only four squadrons in occupation – earlier there had been eight. In July I had commenced sandbagging hangars and quarters and completed this work early in August.

During the first week in the latter month bombs fell near my hangars on two occasions, no casualties being caused.

On the evening of the 25th August the enemy carried out a pre-arranged bomb raid on our aerodrome putting my squadron out of action.

At about 2100 hrs the first EA crossed the aerodrome at between 6,000 and 7,000 ft, dropping three bombs. The first fell and detonated in a hangar containing six Bristols fully loaded with petrol, ammunition, and 25lb bombs – the second and third exploded in the centre of aerodrome.

Immediately the hangar burst into flames and well illuminated the squadron's camp, hangars, &c.

The first machine circled and unloaded the balance of its load of bombs, hitting another hangar full of machines and the transport lines. Between the two hangars hit was one which I had for some time been using for the station or Wing cinema and concert hall. This hangar was protected by a sandbag wall four feet high, and as all the occupants remained seated no one was hit by flying splinters from the first or second salvo of bombs. As the 200 (or may have been 250) Officers and men streamed out into the aerodrome the second bomber was heard approaching. This, coupled with the intense heat of the burning hangars on either side, caused a complete panic.

Stupidly the crowd stampeded towards the approaching machine and a number of men were hit by two bombs which fell short.

Before the panic-stricken crown (mostly visitors) got clear of the camp a bomb fell in its midst killing several officers and wounding others, also setting the quarters alight.

Assisted by my EO, and a number of Australian privates bivouacked on the edge of the aerodrome, I managed to draw seven machines clear of the burning hangars; all were now on fire.

Whilst attempting to get machines into the open the third and fourth bombers dropped more bombs on the hangars and camp, wounding several of the small rescue party. In all the bombers secured thirteen direct hits on hangars, quarters, transport, offices and workshops. Fortunately the bombs were small ones or our casualty roll would have been very big.

The squadron's losses (*below*) were light compared with those amongst visitors and passers by, many being wounded by splinters:

2 Officers killed;
7 Officers wounded;
7 O ranks wounded (? 2 killed).

The casualties amongst visitors were 6 killed and 14 wounded.

All transport was destroyed.

Seven or eight Bristols were rescued, but these were mostly damaged and unserviceable.

The effect on everyone's nerves was very marked for some months later, and I had none of my previous difficulty in getting people to build earth walls round quarters and hangars.

I believe my loss in officers was more than stated above, as on being withdrawn to rest I had 14 new pilots and observers posted to me.

After the above the efficiency of the other ranks fell, as also did that of many of my officers, and the month of September was full of up-hill work. Unluckily, Boisdinghem, where we moved for rest, was on the route used nightly by enemy bombers proceeding to and from the coast. The squadron's nerves grew steady at a slow pace, even here.

**Period in Rest**. Three weeks were devoted to air and ground training before work across the lines were commenced on the Lille Sector (Armentières).

**O.P.s**. No 20 Squadron, BF, whom we relieved, had instilled such respect into the enemy scouts that when three flights went on patrol no hostile machines were met. Flight patrols were decided on, so as to entice the enemy scouts to close.

This he did immediately, though in superior numbers and from above. Two of our flights, with new leaders and several new pilots, were engaged separately on successive days, and roughly handled in the ensuing mêlée. On the occasions when I went out with the whole squadron we could not get close quarters with enemy formations, which were not large (9 to 12 scouts).

When I sent out single flights again, they returned minus at least one machine, and without having the better of the combat. I tried sending 3 or 4 groups of three under the most experienced leaders, flying alone above or below so as to see their tactics. On several occasions when below I sighted EA below us, and signalled to the groups to follow to attack from above; sometimes one group, sometimes two groups came down, but I had usually to fire so many signals that the EA got suspicious and fled east before we could close on them. The conditions were different, though more favourable than in the south.

During the whole of October the majority of the combats were indecisive, and we lost many machines through lack of co-operation by leaders, who were too slow in appreciating a situation.

**O.P.s, Autumn**. By the end of October my new patrol leaders were trained and able to co-operate well, but the EA were now learning caution and were not so easily closed on. In November, leaders, pilots and observers had acquired confidence in themselves, and the old offensive spirit was running high in the squadron. Unfortunately enemy formations became more scarce, and by the second week in November one could scour the country without meeting a single enemy patrol.

Groups of three, pairs, and even single machines patrolled well behind enemy lines without success so we devoted our attentions to "shooting up" ground targets. There was keen and genuine disappointment at the withdrawal of enemy scouts, and more so when news of the Armistice was received.

## General Deductions

**Pilots Pool**. It is essential for new officers to be kept interested and fully occupied and it is most desirable that facilities for flying be provided as even two weeks is a long time for a new pilot to be on the ground.

Interest and occupation, but no flying was provided in 1918. Reinforcement pilots should, when possible, be sent to the type of machine and work in which they have specialised.

**Pilots for Fighter Reconnaissance Squadrons must** receive as good training as those for scout squadrons, and ought to be of as good a type.

Fighting in 2-seaters is as difficult and complicated as fighting a single seater machine.

**Tactics**. The poor fighting tactics of 1917 were greatly improved in 1918. In the latter year there was a lack of co-operation between fighting Squadrons on same sectors. Even at close of war there were no really proved and generally accepted tactics for aerial fighting and the whole was matter of individual taste.

Our ascendancy over the German air service was gained mainly through the courage and dash of the individual patrol leaders, not through superior tactics. Against an enemy of equally high morale we shall be forced to study tactics on the ground instead of leaving decisions and methods to be devised on the spot. Co-operation between leaders of formations will be much easier in future owing to perfection in Radio Telephony.

**Fatigue of Flying Officers**. Battle periods showed that officers could carry out many more hours at low than at high altitudes. Two high patrols a day rendered Officers inefficient at the end of five Summer months, and necessitated their being withdrawn for a period of rest. In the Autumn, winter and early spring, when flying was at lower altitudes, pilots could stand up to longer periods, eight or nine months.

Continuous flying at over 16,000 feet, without oxygen, renders 50 per cent of Officers unfit for flying till after a long rest on ground duties.

Unless carefully checked the highly strung "enthusiast" wears himself out by extra voluntary patrols just when he has become most valuable to his squadron.

The practice of making squadrons find their Flight Commanders from amongst their pilots has great disadvantages. The average good pilot has not sufficient experience successfully to handle a Flight till he has been four or five months with his squadron. He gets promoted usually a month or at most two months before his efficiency begins to fall off. In 1918 certain squadrons did not get a fair chance owing to the constant change of Flight Leaders due to having to fill all vacancies from within the unit.

I am of opinion that only 50 per cent of the Flight Commanders should have been supplied by promoting pilots doing their first tour with a squadron.

**AA Fire** can play an important part in lowering the morale of flying personnel. When coupled with a Defensive Policy "AA" Fire does greatly assist in obtaining local ascendancy; as obtained by the Germans on Belgian coast in early summer of 1917.

**Escorts**, when necessary, must be carried out by aircraft having superior or at least equal speed to the formation being protected. Close escorts are not as effective as offensive patrols over selected areas where opposition is likely to be encountered.

**Ground Strafing** is carried out best by small, fast, and handy scouts having two or more fixed guns firing forward. If two-seaters are to be employed they should be armoured and carry additional guns.

**Night Bombing** has a lasting and cumulative moral effect on non-fighting, and fighting personnel. Continuous bombing by night needs to be followed up by day bombing to put an aerodrome completely out of action.

In future European wars squadrons will have to be dispersed to a greater extent on the ground. Further, when siting hangars and camps more careful consideration must be given to bombing attacks. The introduction of aircraft not requiring hangars for protection will greatly simplify protection from air attacks.

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